PHOTOFACT® Technical Service Data

SET 2910

MODELS KV-27EXR25 (CHASSIS SCC-D50F-A), KV-27EXR20 (CHASSIS SCC-D50E-A)

SONY

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For Supplier Address,
See PHOTOFACT Annual Index

SONY

Model **KV-27EXR25** (Chassis **SCC-D50F-A)**

Complete coverage
for servicing a television receiver...

- Schematics
- Parts lists
- Component locations
- Troubleshooting guide

Coverage includes this additional model and chassis:

MODEL	CHASSIS
KV-27EXR20	**SCC-D50E-A**

HOWARD W. SAMS & COMPANY

DECEMBER 1991 SET 2910

2910

TROUBLESHOOTING

POWER SUPPLY

Check AC Fuse F60 1.

If F60 1 is open:

Check Bridge Rectifier Diodes (D601, and D602), Resistor (R601), Capacitors. C601, C603 thru C606, Electrolytics C607, and C650, Power Converter IC (IC65 1), and Power Transformer (T604).

Apply 120V and check for 17.0V at the (+) lead of D602.

If 17.0V is missing:

Check Line Filters (T601, T602), Power Transformer (T604), Capacitors C608, C609, Electrolytic C610, and D602.

If 17.0V is present, check for 150V* at the (+) lead of D601.

If 150V* is missing:

Check the voltages, waveforms, and components associated with Power Relay (RY601), and Relay Driver Transistor (Q601), and D601.

Note: The set may be in shutdown. Refer to the "High Voltage Shutdown" section of this Troubleshooting guide.

If 150V* is present at the (+) lead of D601, check for the proper waveform at pin 1 of IC65 1.

If the waveform is missing:

Check the voltages, waveforms, and components associated with IC65 1, Transfer IC (IC652), Converter Transformer (T651), and Soft Start Transistor (Q612).

If the proper waveform is present at pin 1 of IC65 1:

Check the voltages, waveforms, and components associated with T6.5 1.

* Taken from isolated ground.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by Diode D531, rectifying pulses from the Horizontal Output Transformer (T500). Should the high voltage increase, the rectified voltage at the cathode of Diode D531 will also increase, This will cause the voltage at pin 8 of Protect Module (PM501) to increase and turn on Protect Transistors (Q607, Q608) which causes Relay Drive Transistor (4601) to turn off and remove power from the set.

To troubleshoot, remove Resistor R629 fom the circuit. Use a variac for AC power. Start at 90VAC and increase as necessary to locate and repair the defect. Return R629 to the circuit.

Note: Care should be taken in defeating the high voltage shutdown circuit, as this may cause excessive X-radiation and damage the CRT, T500, and associated components. Monitor the high voltage and troubleshoot.

HORIZONTAL

Determine if the TV is in shutdown:

Refer to the "High Voltage Shutdown" section of this Troubleshooting guide.

If the TV is not in shutdown, inject a horizontal signal at the base of the Horizontal Output Transistor (Q502).

If horizontal deflection is now present:

Check the voltages, waveforms, and components associated with pins 37, 39, 41, and 45 of Y/C/J IC (IC301), and Horizontal Drive Transistor (Q501).

If there is no horizontal sweep:

Check the voltages, waveforms, and components associated with Q502, and Horizontal Output Transformer (T500), and check components associated with Diodes D5 17, D5 19, D520, D521, and D531 for defects.

The high voltage rectifier is part of T500 and if defective will effect the performance of the horizontal circuits.

If the horizontal oscillator is off frequency:

Check the voltages, waveforms, and components associated with AFC-DET Transistor (Q307), and Buffer Transistor (Q306).

Horizontal linearity or foldover problems may be caused by Capacitors C506, C507, and C509 beiig defective.

VERTICAL

Inject a vertical drive signal at pin 3 1 of Y/C/J IC (IC301).

If vertical deflection is now present:

Check the voltages, waveforms, and components associated with pins 29 thru 34, 38, and 44 of IC301.

If there is still no vertical deflection:

Check the voltages, waveforms, and components associated with Vert Out IC (IC500).

Vertical linearity or foldover problems may be caused by pincushion, vertical feedback and bias circuits:

Check the voltages, waveforms, and components associated with Pin Correction IC (IC531) and Pin Out Transistor (4530).

Also check Electrolytics C328, C538, C540, C562, C563, and C566 for defects.

IF-AGC

Inject a video signal at the IF input and check for video on the CRT.

If video is present:

Check the tuner, tuner control, and tuner AFC circuits.

TROUBLESHOOTING continued

If there is no video on the CRT, check for a video waveform at TP12.

If video is present at TP12:

Refer to the "Video" section of this Troubleshooting guide.

If there is no video at TP12:

Check the voltages, waveforms, and components associated with IF Module (IF201), and AGC Mute Transistor (Q102).

A defective AGC circuit can cause an overloaded picture, excessive snow or loss of audio and video.

See the AGC Voltage Chart for AGC voltages with signal.

AGC Voltage Chart

IF201

pm 1 5.3V

SYNC

If there is no vertical or horizontal sync:

Check the voltages, waveforms, and components associated with Y Buffer Transistor (4301).

If there is no vertical sync:

Check the voltages, waveforms, and components associated with pins 38, and 44 of Y/C/J IC (IC301), V/Sext 1 Transistor (Q302), V/Sext 2 Transitor (Q303), and V/Sext 3 Transistor (Q304).

If there is no horizontal sync:

Check the voltages, waveforms, and components associated with pins 41, and 45 of IC301.

VIDEO

Inject a signal at TP12, and check for video on the CRT

If video is present:

Refer to the "IF-AGC" section of this Troubleshooting guide.

If there is no video on the CRT, check for a video waveform at pin 6 of Comb Filter (CM1301).

If video is missing at pm 6 of CM1301:

Check the voltages, waveforms, and components associated with Buffer Transistors (Q409, Q410), and AV-Switch IC (IC444), and CM1301.

If video is present at pin 6 of CM1301, check for a video waveform at the emitter of Y Amp Transistor (4305).

If the video is missing:

Check the voltages, waveforms, and components associated with 4305, Buffer Transistor (Q416), and Y Switch IC (IC402).

If the waveform is present at the emitter of Q305:

Check the voltages, waveforms, and components associated with pins 3, 4, 8, 26, and 27 of Y/C/J IC (IC301), Buffer Transistors (Q310, Q313), Gamma Comp 1 Transistor (Q315), and Equalizer Transistor (Q314), Y Clamp Transistor (Q317), and Gamma Comp 2 Transistor (Q316).

If brightness is inadequate or cannot be controlled:

Check the voltages, waveforms, and components associated with pin 5 of V901.

CHROMA

Check for a chroma waveform at pm 5 of Y/C/J IC (IC301).

If the waveform is missing:

Check the voltages, waveforms, and components associated with Buffer Transistor (Q417), C-Switch IC (IC403), and pin 4 of Comb Filter (CM1301).

If chroma waveform is present at pin 5 of IC30 1, cheek for the proper waveforms at pins 20, 22, 24 of IC301.

If these waveforms are missing:

Check the voltages, waveforms, and components associated with pins 5, 6, 7, 19 thru 25 of IC301.

Check the 3.58MHz oscillator at pin 7 of IC301.

If the proper wavforms are present at pins 20, 22, 24 of IC301:

Refer to the "Raster" section of this Troubleshooting guide.

RASTER

Check the CRT and CRT voltages. Cheek the voltages, waveforms, and components associated with Buffer Transistor (Q711), SW 1 Transistor (Q710), and SW 2 Transistor (4712).

If there is no Red:

Cheek the voltages, waveforms, and components associated with pin 20 of Y/C/J IC (IC301), Red Output Transistor (Q708), Video Amp Transistor (Q709), and Red 1K Det Transistors (Q707,Q7 16).

If there is no Green:

Check the voltages, waveforms, and components associated with pin 22 of IC301, Green Output Transistor (Q704), Video Amp Transistor (Q705), and Green 1K Det Transistors (4706, Q7 15).

If there is no Blue:

Check the voltages, waveforms, and components associated with pm 24 of IC301, Blue Output Transistor (Q701), Video Amp Transistor (Q702), and Blue 1K Det Transistors (Q703, Q7 14).

If the raster has a keystone shape:

Check the Deflection Yoke (L550).

TROUBLESHOOTING continued

If the raster has height or width problems:

Refer to "Vertical", "Horizontal", and "Power Supply" sections of this Troubleshooting guide.

AUDIO

Select an active TV channel and check for an audio waveforms at pins 1 and 2 of MTS Decode IC (IC25 1).

If there is no audio:

Check the voltages, waveforms, and components associated with IC25 1, and pin 10 of IF Module (IF201).

If audio waveforms are present at pins 1 and 2 of IC251, cheek for audio waveforms at pins 1 and 5 of Audio Amp IC (IC405).

If audio waveforms are missing:

Check the voltages, waveforms, and components associated with Audio Buffer Transistors (4430, Q431), and Buffer Transistors (Q202, Q203).

If audio waveforms are present at pins 1 and 5 of IC405:

Check the voltages, waveforms, and components associated with IC405, Audio Mute Transistors (Q432, Q433), and Mute Transistor (Q 103).

PIP HORIZONTAL

Check for the proper waveforms at pin 9 of A/D Conv IC (IC2206), and pin 24 of PIP Control IC (IC2204).

If the waveforms are missing:

Check the voltages, waveforms, and components associated with pins 4, 6 thru 10, and 28 of Y/C/J IC (IC2103), pins 8 and 9 of IC2 104, Horizontal Pulse Transistor (Q2120), Horizontal Out Transistor (4212 1), and Horizontal Drive Transistor (42122).

If waveforms are present, cheek for the proper waveform at pin 60 of IC2204.

If waveform at pin 60 of IC2204 is missing:

Check the voltages, waveforms, and components associated with Horizontal Width IC (IC2102), Horizontal Pulse Transistor (Q2117), and pin 39 of Y/C/J IC (IC301).

If waveform at pin 60 of IC2204 is present:

Check the voltages, waveforms, and components associated with IC2204, and IC2206.

PIP VERTICAL

Check for the proper waveform at pin 23 of PIP Cont IC (IC2204).

If the waveform is missing:

Check the voltages, waveforms, and components associated with pins 10 thru 13 of IC2104, Vertical Pulse Transistor (Q2119), and pins 5 and 36 of Y/C/J IC (IC2103).

If waveform is present at pin 23 of IC2204, check for the proper waveform at pin 61 of IC2204.

If waveform is missing:

Check the voltages, waveforms, and components associated with pins 1 and 2 of IC2 104, and Buffer Transistor (Q3 12)

If waveform is present at pin 23 of IC2204:

Check the voltages, waveforms, and components associated with IC2204.

PIP SYNC

If there is no vertical or horizontal sync:

Check the voltages, waveforms, and components associated with V Buffer 3 Transistor (Q2125), and Buffer Transistor (Q2130).

If there is no vertical sync:

Check the voltages, waveforms, and components associated with pm 5 of Y/C/J IC (IC2103).

If there is no horizontal sync:

Check the voltages, waveforms, and components associated with pin 4 of IC2103.

PIP VIDEO

Check for the proper waveform at pin 34 of Y/C/J IC (IC2103).

If video is missing at pin 34 of IC2 103:

Cheek the voltages, waveforms, and components associated with V Buffer 1 Transistor (Q2245), V Buffer 2 Transistor (Q2123), Buffer Transistor (Q413), and AV-SW IC (IC444).

If video is present at pin 34 of IC2103, check for a video waveform at pin 16 of A/D Conv IC (IC2206).

If the waveform is missing:

Check the voltages, waveforms, and components associated with Y Out Transistor (Q2139), Y Buffer 2 Transistor (Q2102), Y Amp Transistor (Q2 10 1), Y Buffer 1 Transistor (Q2116), and pins 14, 21, 23, 25, 30, 32, 33, of Y/C/J IC (IC2103).

If waveform is present at pin 16 of IC2206, check for the proper waveform at pm 4 of Y D/A Conv IC (IC2201).

If the waveform is missing at at pin 4 of IC2201:

Check the voltages, waveforms, and components associated with IC2201, pins 1, 46 thru 5 1, and 54 of IC2204.

Cheek for the proper waveform at the emitter of YS Buffer Transmitter (42244).

If the wave form is missing at the emitter of Q2244:

Check the voltages, waveforms, and components associated with 42244, pins 3 thru 6 of IC2 104, and pin 3 1 of IC2204.

If the waveform is present at pin 4 of IC2201:

Check the voltages, waveforms, and components associated with Y Buffer Transistor (42202).

PIP CHROMA

Check for the waveforms at pins 20 and 22 of Y/C/J IC (IC2103).

If the waveforms are missing:

Check the voltages, waveforms, and components associated with pins 16 thru 22, and 31 of IC2 103.

Check the 3.58MHz oscillator at pins 15 and 18 of IC2103.

Check the voltages and components associated with Sub Color Control and pin 13 of IC2103.

Check the voltages and components associated with Sub Hue Control and pin 12 of IC2103.

If chroma waveform is present at pins 20 and 22 of IC2103, check for the proper waveforms at pins 17 and 18 of A/D Conv IC (IC2206).

If the waveforms are missing at pins 17 and 18 of IC2206:

Check the voltages, waveforms, and components associated with R-Y Out Transistor (Q2103), and B-Y Out Transistor (42114).

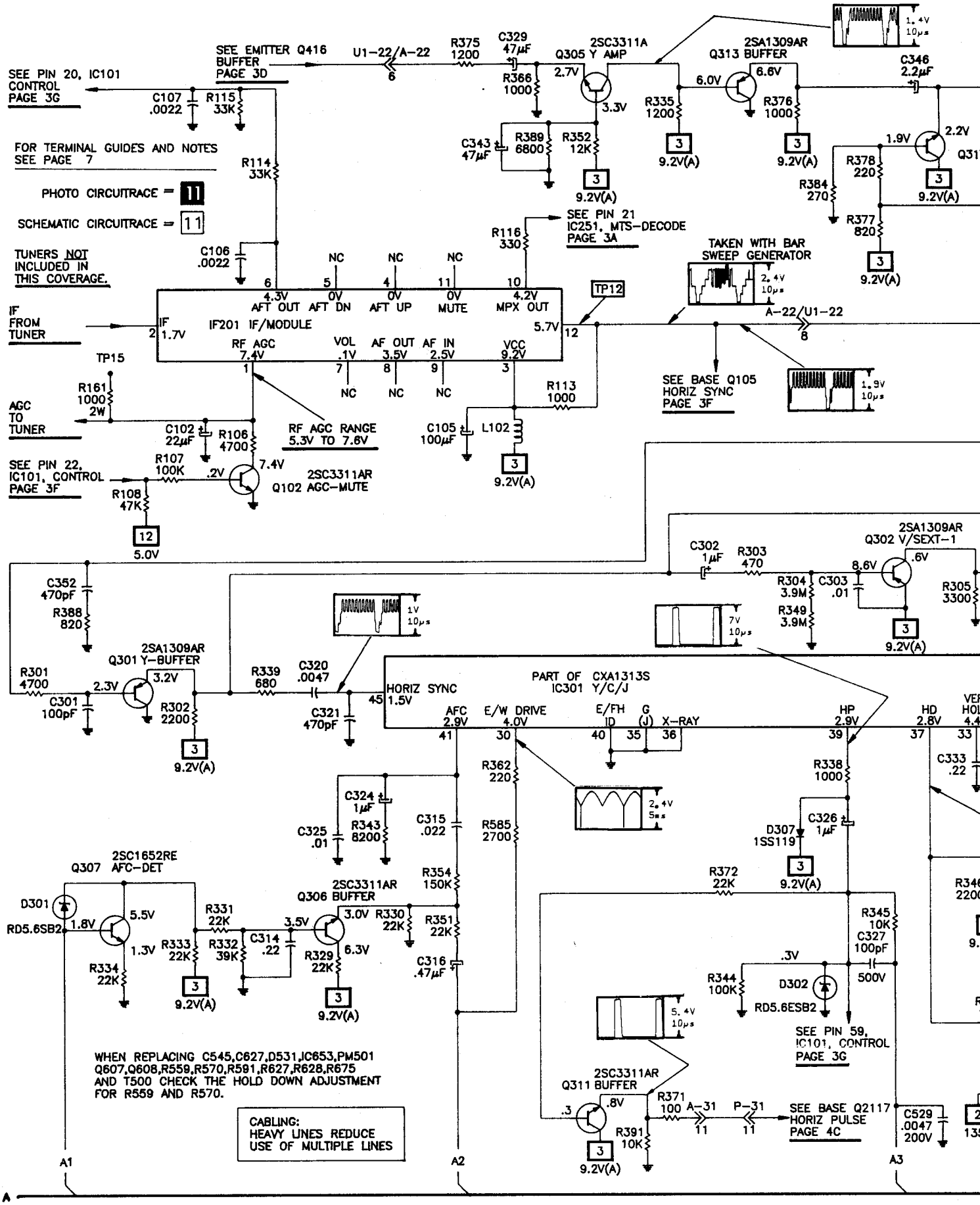
If the waveforms are present at pins 17 and 18 of IC2206, check for the proper waveforms at pins 4 of R-Y D/A Conv IC (IC2202), and B-Y D/A Conv IC (IC2203).

If the waveforms are missing at pin 4 of IC2202, and IC2203:

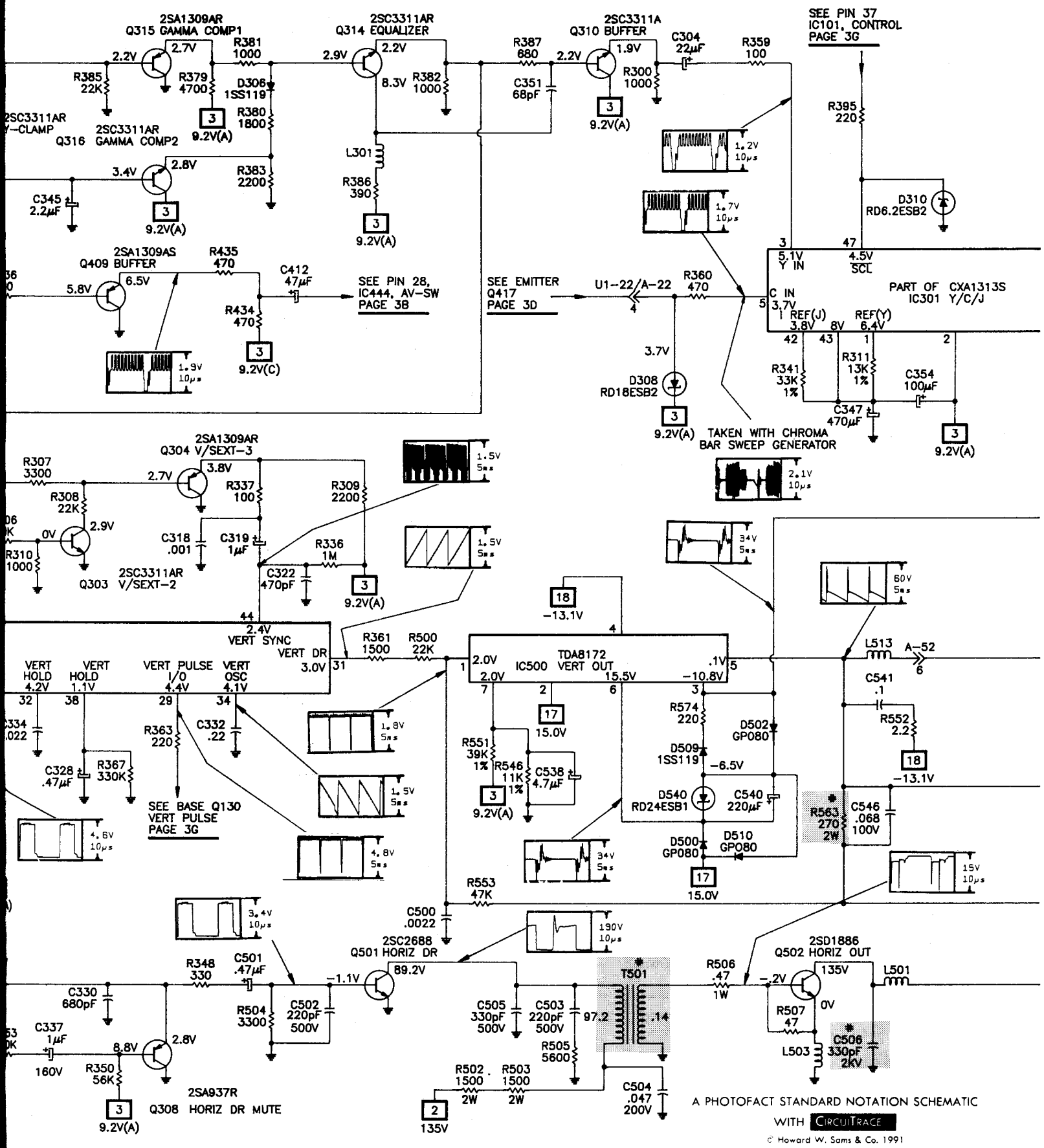
Check the voltages, waveforms, and components associated with IC2202, IC2203, PINP Conv IC (IC2204), and IC2206.

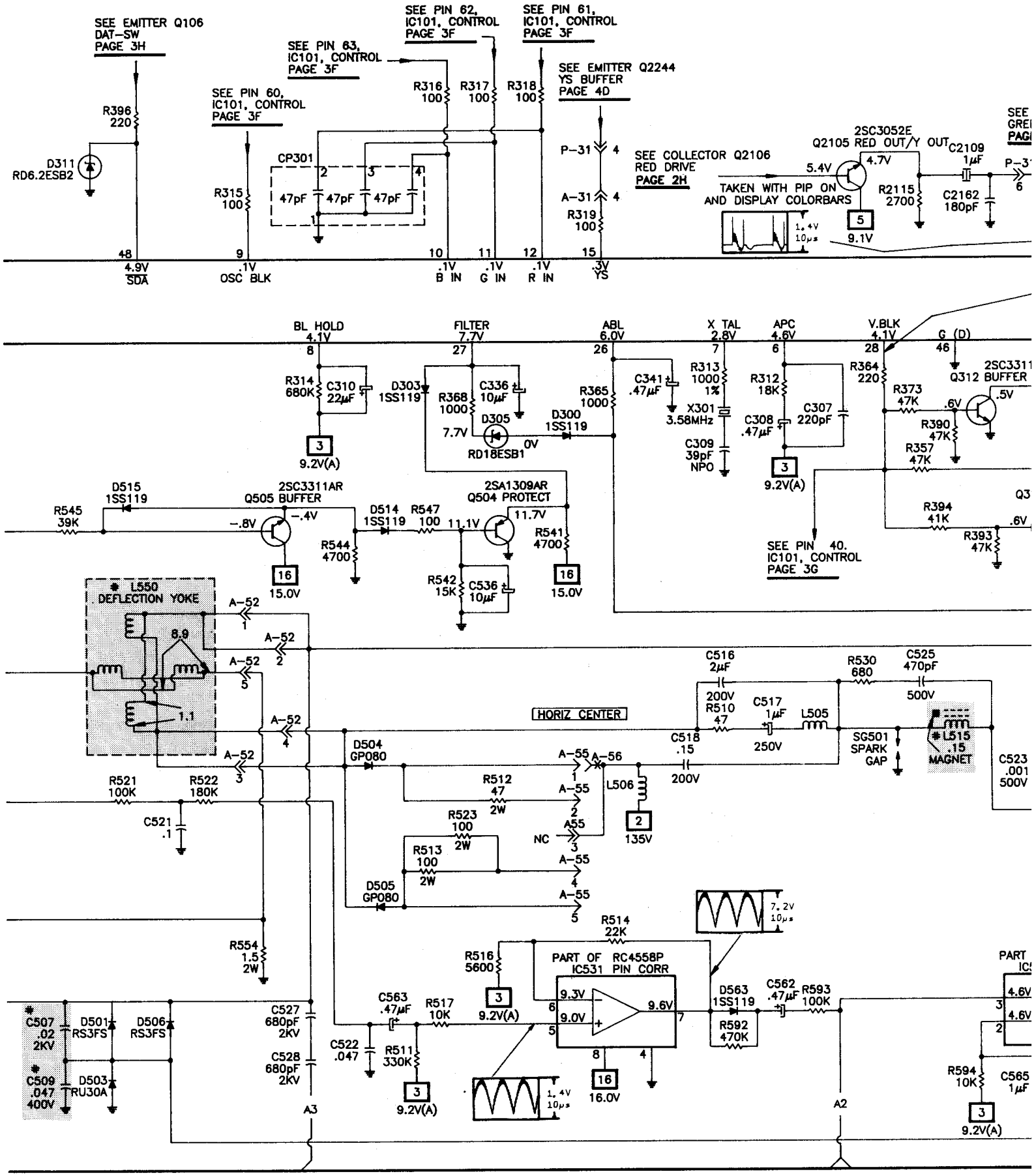
If the waveforms are present at pin 4 of IC2202, and IC2203:

Check the voltages, waveforms, and components associated with R-Y Buffer Transistor (Q2203), B-Y Buffer Transistor (Q2204), Red Drive Transistor (Q2106), Blue Drive Transistor (Q2107), and Green Drive Transistor (42109).

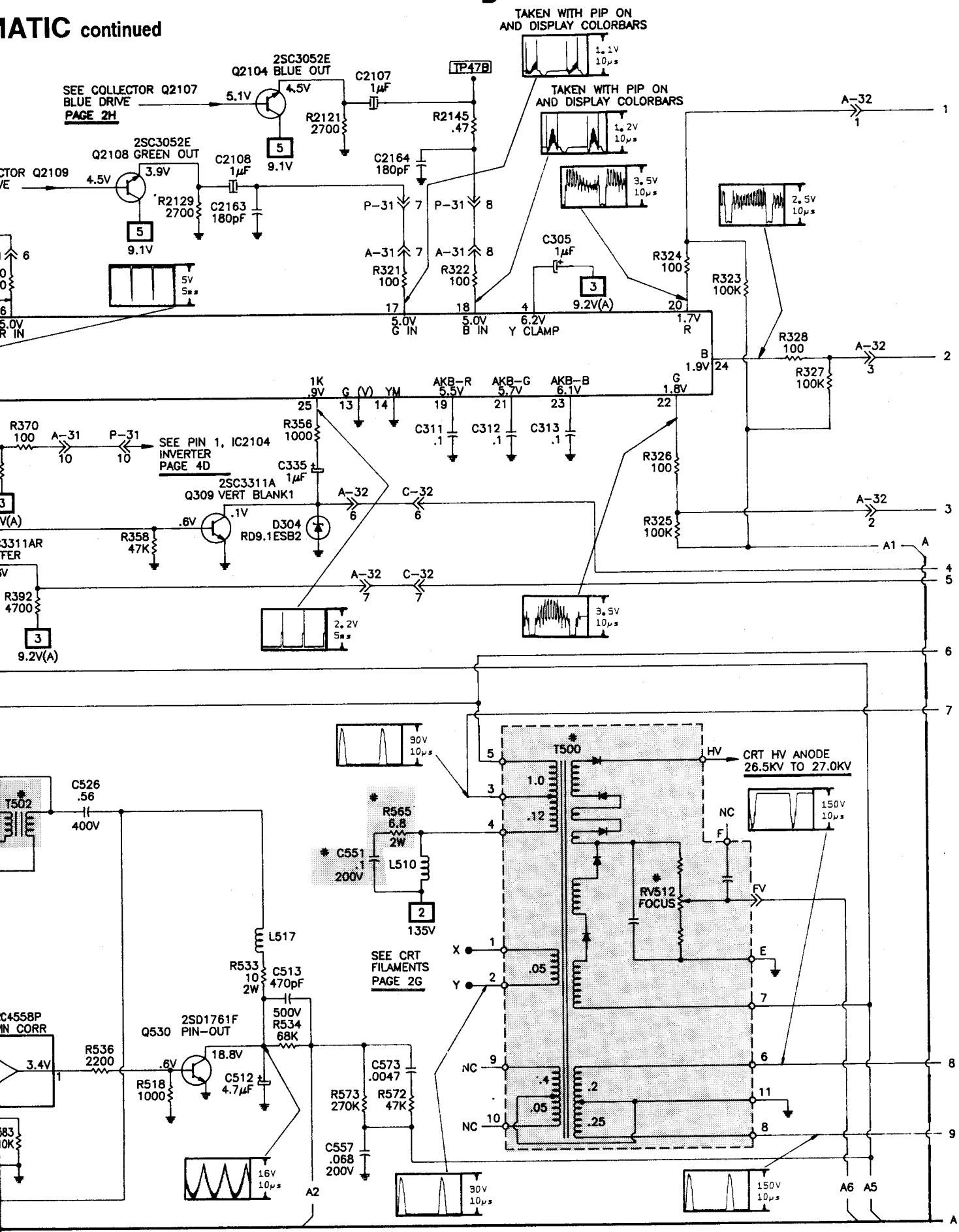

SEE PIN 20, IC101 CONTROL PAGE 3G
SEE EMITTER Q416 BUFFER PAGE 3D
U1-22/A-22
R375 1200
C329 47µF
2SC3311A Q305 Y AMP
2SA1309AR Q313 BUFFER
C346 2.2µF
C107 .0022
R115 33K
R366 1000
R335 1200
R376 1000
C343 47µF
R389 6800
R352 12K
R378 220
R384 270
R377 820
FOR TERMINAL GUIDES AND NOTES SEE PAGE 7
PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11
R114 33K
SEE PIN 21 IC251, MTS-DECODE PAGE 3A
R116 330
TUNERS NOT INCLUDED IN THIS COVERAGE.
C106 .0022
TAKEN WITH BAR SWEEP GENERATOR
IF FROM TUNER
IF201 IF/MODULE
AFT OUT AFT DN AFT UP MUTE MPX OUT
RF AGC VOL AF OUT AF IN VCC
TP12
TP15
A-22/U1-22
SEE BASE Q105 HORIZ SYNC PAGE 3F
R161 1000 2W
AGC TO TUNER
C102 22µF
R106 4700
RF AGC RANGE 5.3V TO 7.6V
C105 100µF
L102
R113 1000
SEE PIN 22, IC101, CONTROL PAGE 3F
R107 100K
2SC3311AR Q102 AGC-MUTE
R108 47K
2SA1309AR Q302 V/SEXT-1
C302 1µF
R303 470
R304 3.9M
C303 .01
R349 3.9M
R305 3300
C352 470pF
R388 820
2SA1309AR Q301 Y-BUFFER
R301 4700
C301 100pF
R339 680
C320 .0047
C321 470pF
R302 2200
HORIZ SYNC
PART OF CXA1313S IC301 Y/C/J
AFC E/W DRIVE E/FH ID G (J) X-RAY HP HD
R362 220
R585 2700
C324 1µF
C325 .01
R343 8200
C315 .022
R338 1000
C326 1µF
D307 1SS119
R372 22K
2SC1652RE Q307 AFC-DET
D301 RD5.6SB2
2SC3311AR Q306 BUFFER
R354 150K
R331 22K
R333 22K
R332 39K
C314 .22
R329 22K
R330 22K
R351 22K
C316 .47µF
R345 10K
C327 100pF
500V
R344 100K
D302 RD5.6ESB2
SEE PIN 59, IC101, CONTROL PAGE 3G
2SC3311AR Q311 BUFFER
R371 100
A-31
P-31
R391 10K
SEE BASE Q2117 HORIZ PULSE PAGE 4C
C529 .0047 200V
WHEN REPLACING C545,C627,D531,IC653,PM501 Q607,Q608,R559,R570,R591,R627,R628,R675 AND T500 CHECK THE HOLD DOWN ADJUSTMENT FOR R559 AND R570.
CABLING: HEAVY LINES REDUCE USE OF MULTIPLE LINES
A1
A2
A3

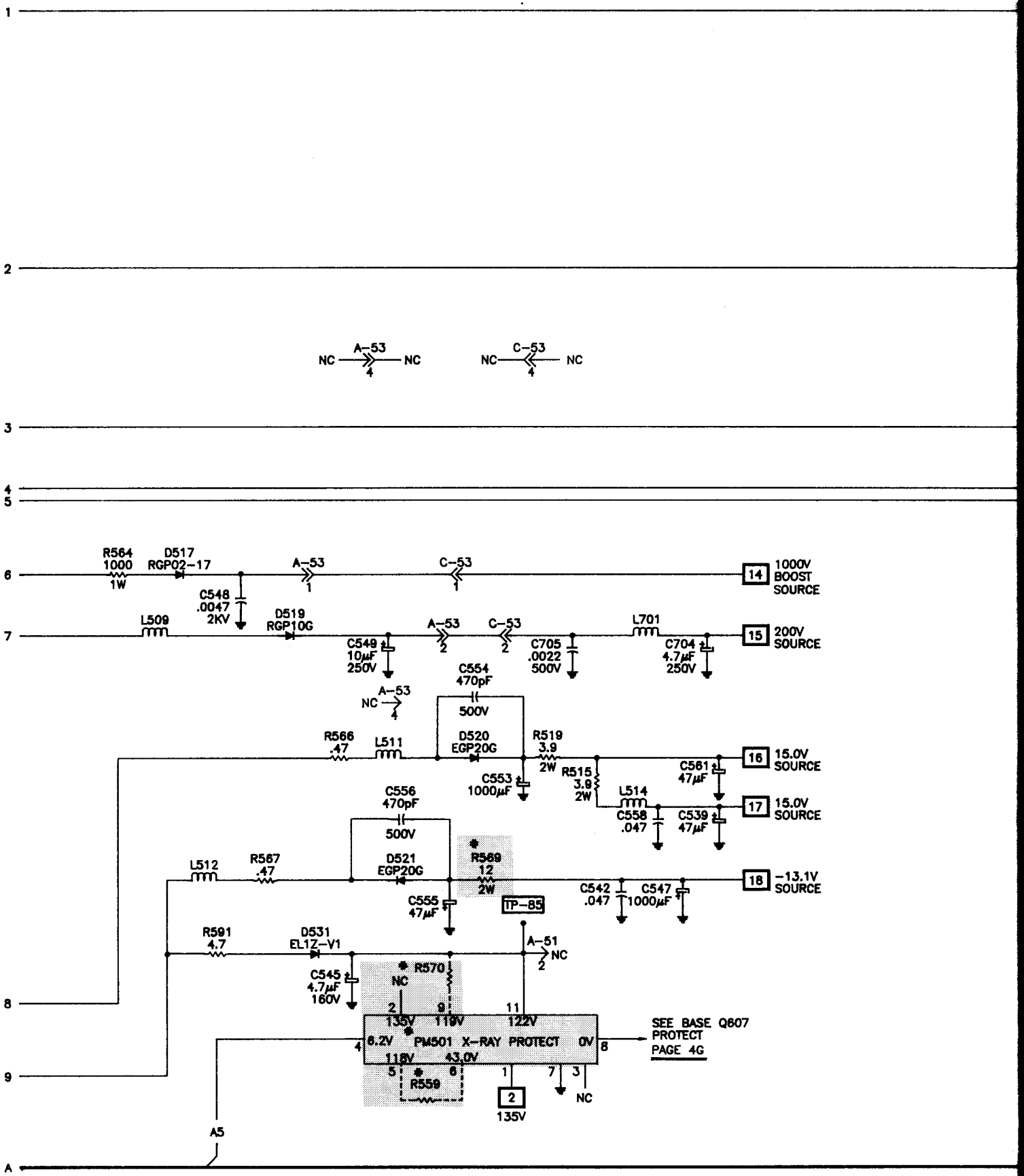
SCHEMATIC


2SA1309AR
Q315 GAMMA COMP1
2SC3311AR
Q314 EQUALIZER
2SC3311A
Q310 BUFFER
SEE PIN 37
IC101, CONTROL
PAGE 3G
R381 1000
R385 22K
R379 4700
D306 1SS119
R380 1800
R383 2200
2SC3311AR
Q316 GAMMA COMP2
2SC3311AR
Y-CLAMP
C345 2.2µF
L301
R386 390
R382 1000
C351 68pF
R387 680
C304 22µF
R359 100
R300 1000
R395 220
D310 RD6.2ESB2
9.2V(A)
9.2V(C)
2SA1309AS
Q409 BUFFER
R435 470
C412 47µF
R434 470
SEE PIN 28,
IC444, AV-SW
PAGE 3B
SEE EMITTER
Q417
PAGE 3D
U1-22/A-22
R360 470
C IN
Y IN
SCL
REF(J)
REF(Y)
PART OF CXA1313S
IC301 Y/C/J
R341 33K 1%
R311 13K 1%
C354 100µF
C347 470µF
D308 RD18ESB2
TAKEN WITH CHROMA
BAR SWEEP GENERATOR
2SA1309AR
Q304 V/SEXT-3
R307 3300
R308 22K
R337 100
R309 2200
C318 .001
C319 1µF
R336 1M
C322 470pF
Q303 V/SEXT-2
R310 1000
VERT SYNC
VERT DR
R361 1500
R500 22K
TDA8172
IC500 VERT OUT
VERT HOLD 4.2V
VERT HOLD 1.1V
VERT PULSE I/O 4.4V
VERT OSC 4.1V
C328 .47µF
R367 330K
R363 220
C332 .22
SEE BASE Q130
VERT PULSE
PAGE 3G
R551 39K 1%
R546 11K 1%
C538 4.7µF
15.0V
R574 220
D502 GP080
D509 1SS119
D540 RD24ESB1
C540 220µF
D500 GP080
D510 GP080
R563 270 2W
C546 .068 100V
L513
A-52
C541 .1
R552 2.2
R553 47K
C500 .0022
2SC2688
Q501 HORIZ DR
2SD1886
Q502 HORIZ OUT
R348 330
C501 .47µF
C330 680pF
C337 1µF
160V
R350 56K
2SA937R
Q308 HORIZ DR MUTE
R504 3300
C502 220pF 500V
C505 330pF 500V
C503 220pF 500V
T501
R505 5600
R502 1500 2W
R503 1500 2W
C504 .047 200V
R506 .47 1W
R507 47
C506 330pF 2KV
L503
L501
A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE
© Howard W. Sams & Co. 1991


SEE EMITTER Q106
DAT-SW
PAGE 3H
SEE PIN 62,
IC101, CONTROL
PAGE 3F
SEE PIN 61,
IC101, CONTROL
PAGE 3F
SEE PIN 63,
IC101, CONTROL
PAGE 3F
SEE PIN 60,
IC101, CONTROL
PAGE 3F
SEE EMITTER Q2244
YS BUFFER
PAGE 4D
R396 220
R316 100
R317 100
R318 100
R315 100
R319 100
D311 RD6.2ESB2
CP301
47pF 47pF 47pF
P-31
A-31
SEE COLLECTOR Q2106
RED DRIVE
PAGE 2H
2SC3052E
Q2105 RED OUT/Y OUT
5.4V
4.7V
C2109 1µF
R2115 2700
C2162 180pF
TAKEN WITH PIP ON
AND DISPLAY COLORBARS
1.4V 10µs
9.1V
48 4.9V SDA
9 .1V OSC BLK
10 .1V B IN
11 .1V G IN
12 .1V R IN
15 .3V YS
BL HOLD 4.1V
FILTER 7.7V
ABL 6.0V
X TAL 2.8V
APC 4.6V
V.BLK 4.1V
G (D)
R314 680K
C310 22µF
D303 1SS119
R368 1000
C336 10µF
D305 RD18ESB1
D300 1SS119
R365 1000
C341 .47µF
R313 1000 1%
X301 3.58MHz
C309 39pF NPO
R312 18K
C308 .47µF
C307 220pF
R364 220
R373 47K
R390 47K
R357 47K
Q312 BUFFER
9.2V(A)
D515 1SS119
2SC3311AR
Q505 BUFFER
2SA1309AR
Q504 PROTECT
R545 39K
D514 1SS119
R547 100
R544 4700
R541 4700
R542 15K
C536 10µF
R394 41K
R393 47K
15.0V
SEE PIN 40.
IC101, CONTROL
PAGE 3G
L550
DEFLECTION YOKE
A-52
HORIZ CENTER
C516 2µF
200V
R510 47
C517 1µF
250V
L505
R530 680
C525 470pF
500V
SG501
SPARK GAP
L515
.15
MAGNET
C523 .001 500V
C518 .15
200V
D504 GP080
A-55
A-56
L506
135V
R521 100K
R522 180K
C521 .1
R512 47 2W
R523 100 2W
R513 100 2W
NC
D505 GP080
R554 1.5 2W
R514 22K
7.2V 10µs
R516 5600
PART OF RC4558P
IC531 PIN CORR
9.3V
9.0V
9.6V
D563 1SS119
R592 470K
C562 .47µF
R593 100K
C507 .02 2KV
D501 RS3FS
D506 RS3FS
C509 .047 400V
D503 RU30A
C527 680pF 2KV
C528 680pF 2KV
C563 .47µF
R517 10K
C522 .047
R511 330K
9.2V(A)
16.0V
1.4V 10µs
A3
A2
R594 10K
C565 1µF
4.6V
4.6V

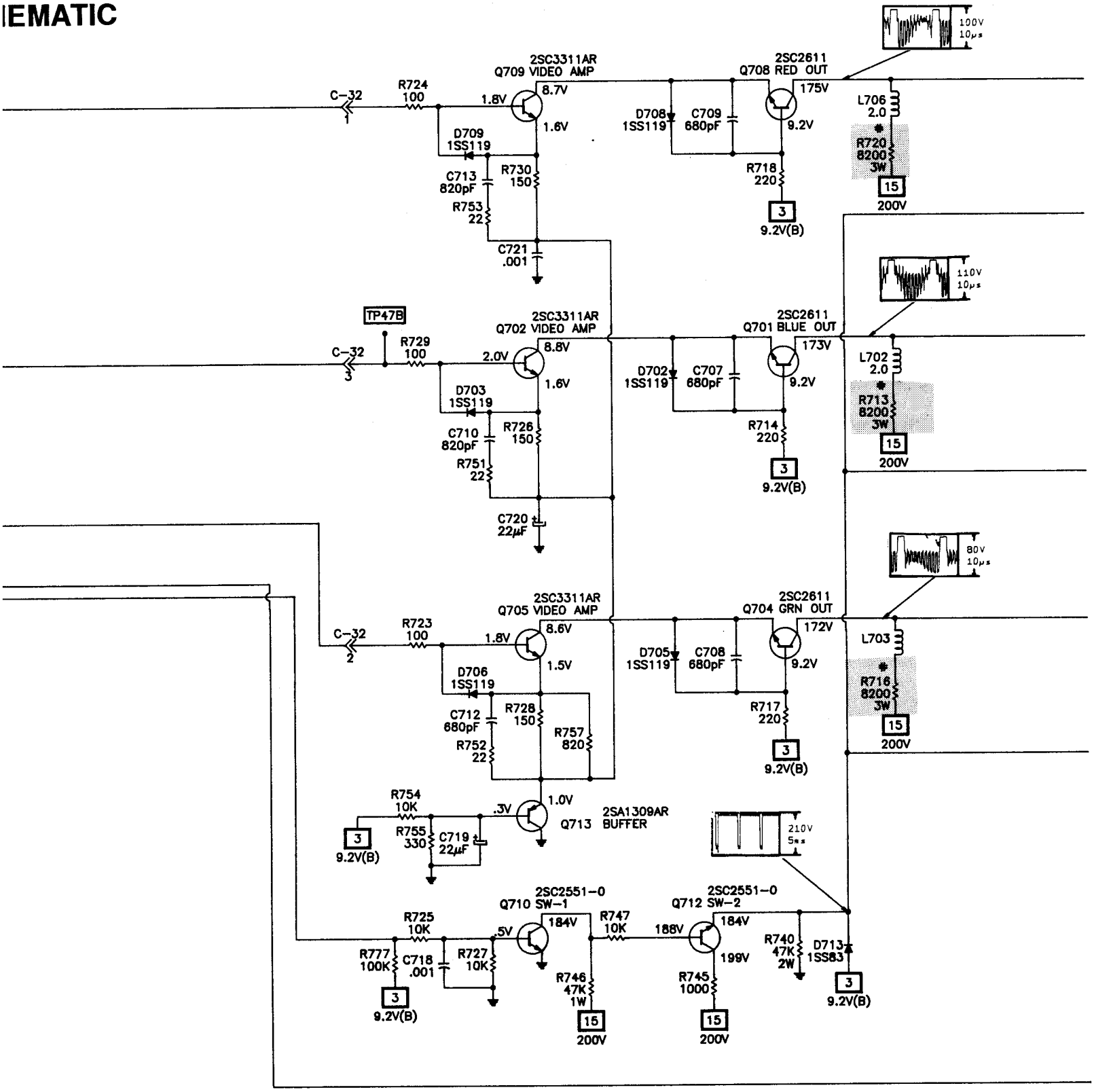
MATIC continued




NC A-53 4 NC
NC C-53 4 NC
R564 1000 1W
D517 RGP02-17
C548 .0047 2KV
L509
D519 RGP10G
C549 10µF 250V
C554 470pF 500V
R566 .47
L511
D520 EGP20G
R519 3.9 2W
C553 1000µF
R515 3.9 2W
L514
C558 .047
C561 47µF
C539 47µF
C556 470pF 500V
L512
R567 .47
D521 EGP20G
R569 12 2W
C555 47µF
TP-85
C542 .047
C547 1000µF
R591 4.7
D531 EL1Z-V1
C545 4.7µF 160V
R570 NC
135V
118V
122V
6.2V
PM501 X-RAY PROTECT
0V
118V
43.0V
R559
L701
C705 .0022 500V
C704 4.7µF 250V
14 1000V BOOST SOURCE
15 200V SOURCE
16 15.0V SOURCE
17 15.0V SOURCE
18 -13.1V SOURCE
A-51 NC 2
SEE BASE Q607 PROTECT PAGE 4G
A5

E

IEMATIC



FOR TERMINAL GUIDES AND NOTES SEE PAGE 7

CABLING:
HEAVY LINES REDUCE
USE OF MULTIPLE LINES

PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE

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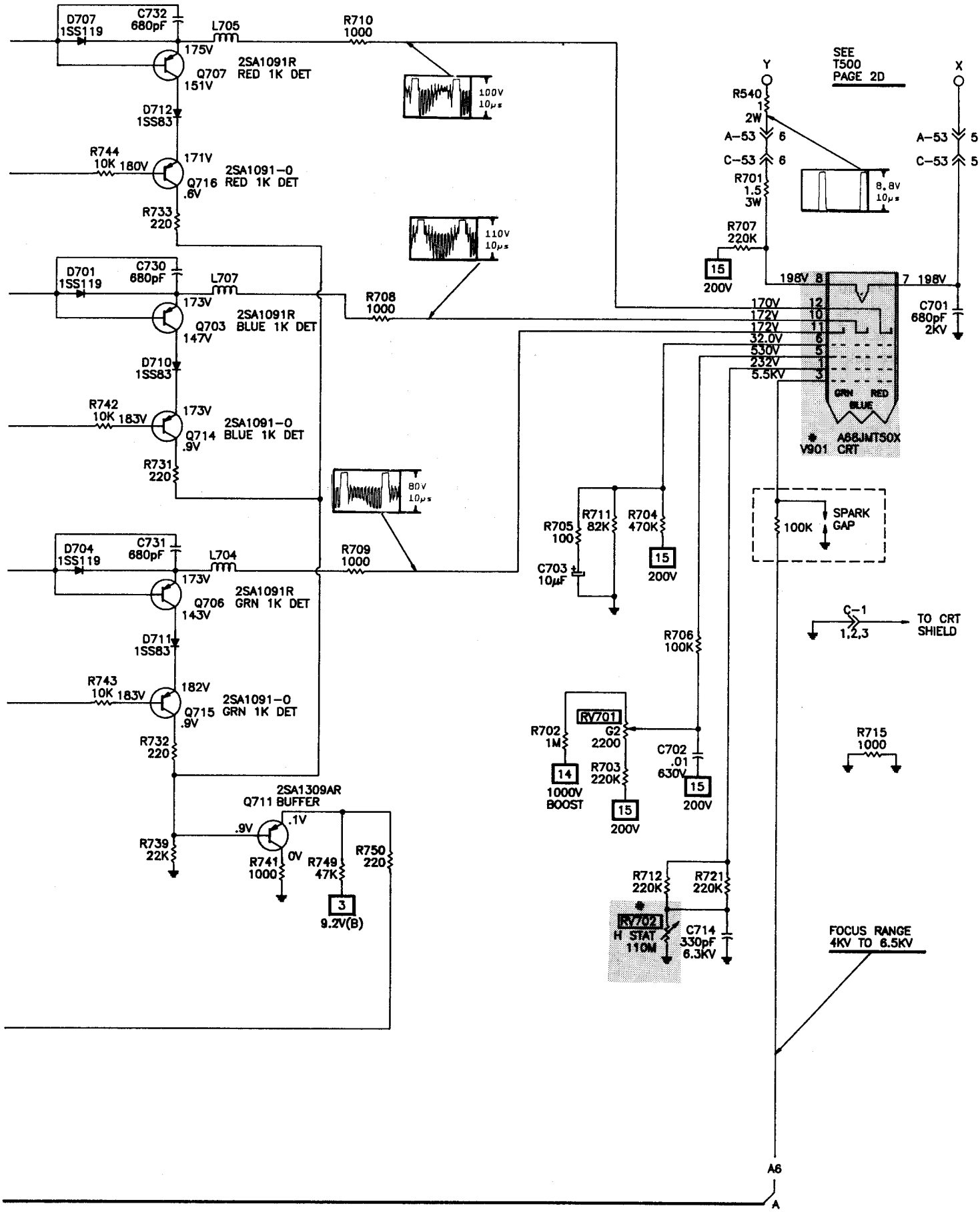
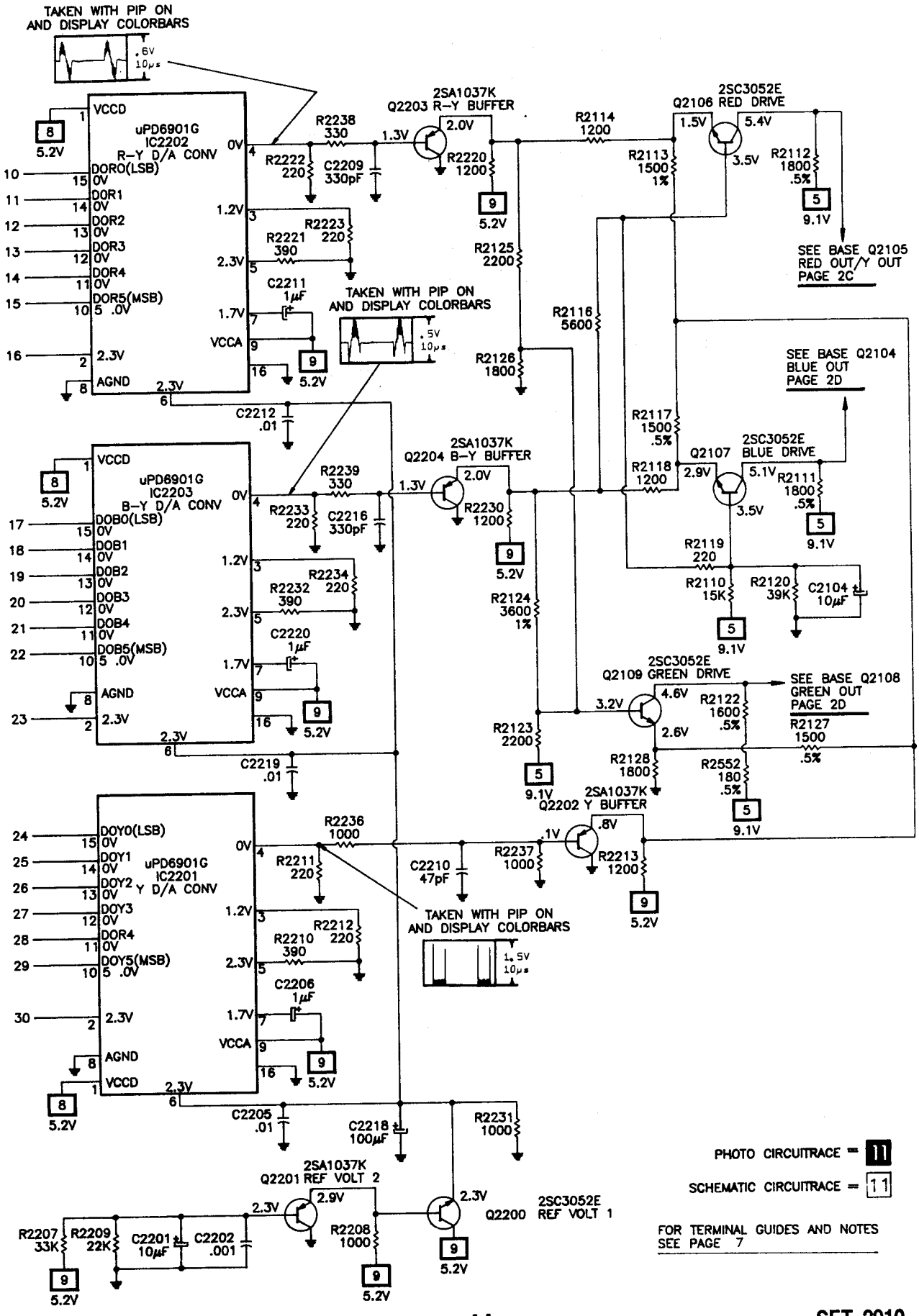
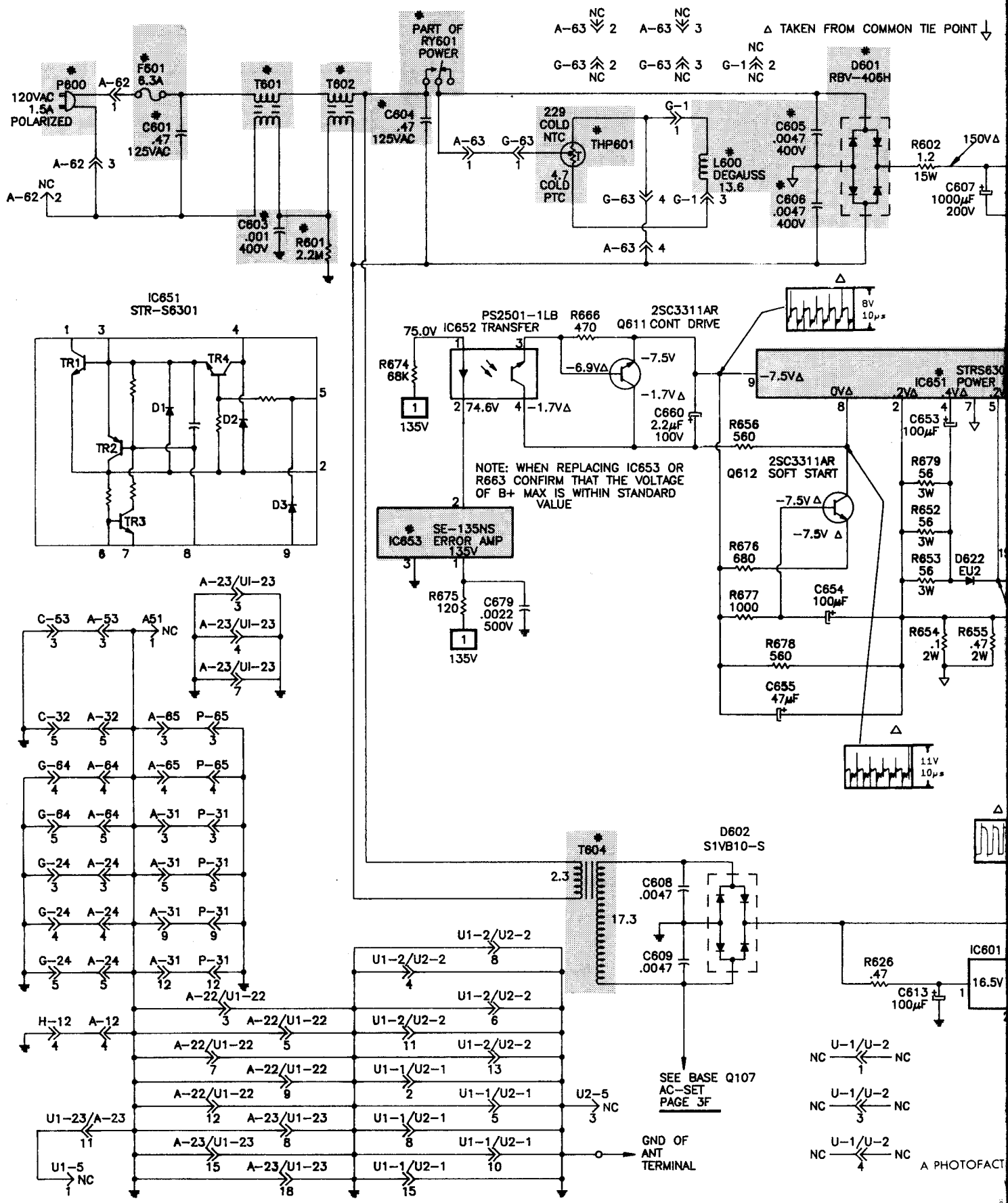

D707 1SS119
C732 680pF
L705
R710 1000
175V
2SA1091R
Q707 RED 1K DET
151V
D712 1SS83
R744 10K 180V
171V
2SA1091-0
Q716 RED 1K DET
.6V
R733 220
100V 10μs
110V 10μs
D701 1SS119
C730 680pF
L707
R708 1000
173V
2SA1091R
Q703 BLUE 1K DET
147V
D710 1SS83
R742 10K 183V
173V
2SA1091-0
Q714 BLUE 1K DET
.9V
R731 220
80V 10μs
D704 1SS119
C731 680pF
L704
R709 1000
173V
2SA1091R
Q706 GRN 1K DET
143V
D711 1SS83
R743 10K 183V
182V
2SA1091-0
Q715 GRN 1K DET
.9V
R732 220
2SA1309AR
Q711 BUFFER
.9V
.1V
0V
R739 22K
R741 1000
R749 47K
R750 220
3
9.2V(B)
SEE T500 PAGE 2D
Y
X
R540 1 2W
A-53 6
C-53 6
A-53 5
C-53 5
R701 1.5 3W
8.8V 10μs
R707 220K
15
200V
198V 8
7 198V
C701 680pF 2KV
170V 12
172V 10
172V 11
32.0V 6
530V 5
232V 4
5.5KV 3
GRN RED BLUE
A68JMT50X
V901 CRT
R705 100
R711 82K
R704 470K
C703 10μF
15
200V
100K
SPARK GAP
C-1
1,2,3
TO CRT SHIELD
R706 100K
R702 1M
RV701
G2
2200
R703 220K
14
1000V BOOST
15
200V
C702 .01 630V
15
200V
R715 1000
R712 220K
R721 220K
RV702
H STAT 110M
C714 330pF 6.3KV
FOCUS RANGE 4KV TO 6.5KV
A6
A

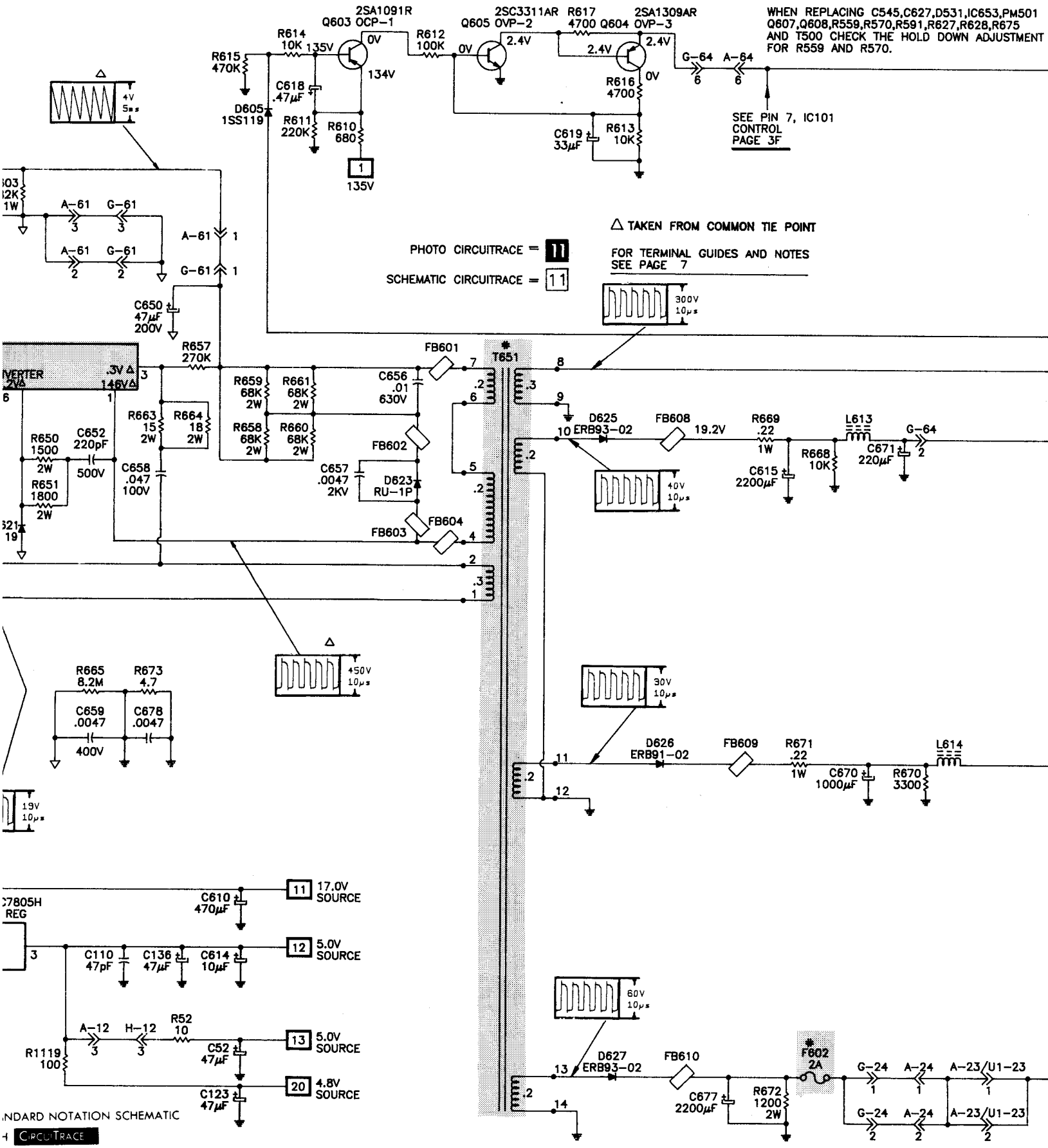
D/A CONVERTER SCHEMATIC



SONY MODELS KV-27EXR25 (CHASSIS SCC-D50F-A), KV-27EXR20 (CHASSIS SCC-D50E-A)


P600
120VAC 1.5A POLARIZED
F601 6.3A
C601 .47 125VAC
T601
T602
PART OF RY601 POWER
C604 .47 125VAC
C603 .001 400V
R601 2.2M
NC A-63 2
A-63 3
G-63 2 NC
G-63 3 NC
NC G-1 2
D601 RBV-406H
△ TAKEN FROM COMMON TIE POINT
229 COLD NTC
THP601
4.7 COLD PTC
L600 DEGAUSS 13.6
C605 .0047 400V
C606 .0047 400V
R602 1.2 15W
150V△
C607 1000μF 200V
IC651 STR-S6301
TR1
TR2
TR3
TR4
D1
D2
D3
PS2501-1LB IC652 TRANSFER
R666 470
2SC3311AR Q611 CONT DRIVE
75.0V
R674 68K
135V
74.6V
-1.7V△
-6.9V△
-7.5V
C660 2.2μF 100V
8V 10μs
-7.5V△
0V△
.2V△
.4V△
IC651 POWER
C653 100μF
R656 560
NOTE: WHEN REPLACING IC653 OR R663 CONFIRM THAT THE VOLTAGE OF B+ MAX IS WITHIN STANDARD VALUE
SE-135NS IC653 ERROR AMP 135V
R675 120
C679 .0022 500V
2SC3311AR Q612 SOFT START
R679 56 3W
R652 56 3W
R653 56 3W
D622 EU2
R676 680
R677 1000
C654 100μF
R654 .1 2W
R655 .47 2W
R678 560
C655 47μF
11V 10μs
T604
D602 S1VB10-S
C608 .0047
C609 .0047
17.3
2.3
R626 .47
C613 100μF
IC601
16.5V
SEE BASE Q107 AC-SET PAGE 3F
GND OF ANT TERMINAL
U-1/U-2 NC
A PHOTOFACT

LY SCHEMATIC



NDARD NOTATION SCHEMATIC

CIRCUITRACE

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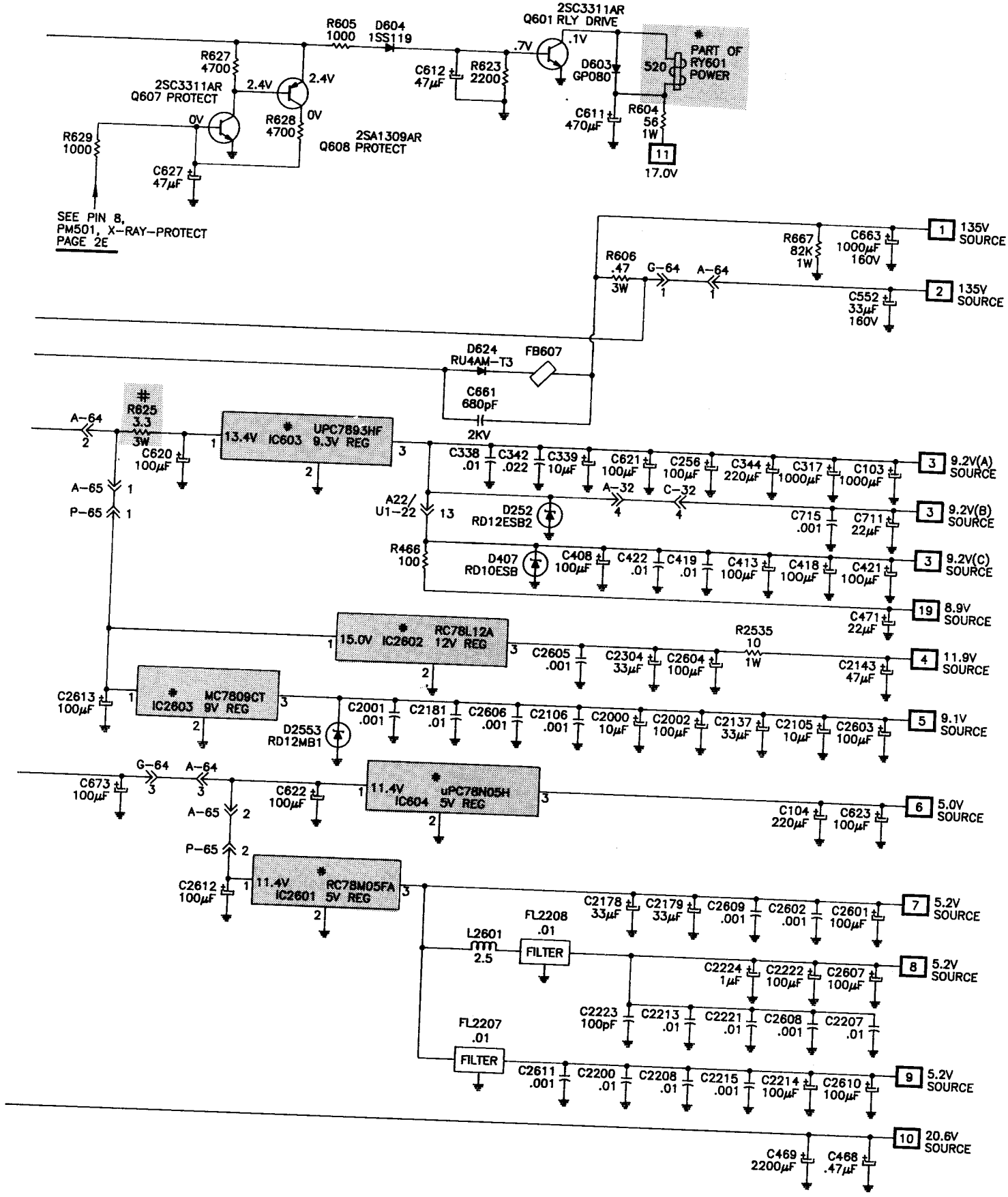
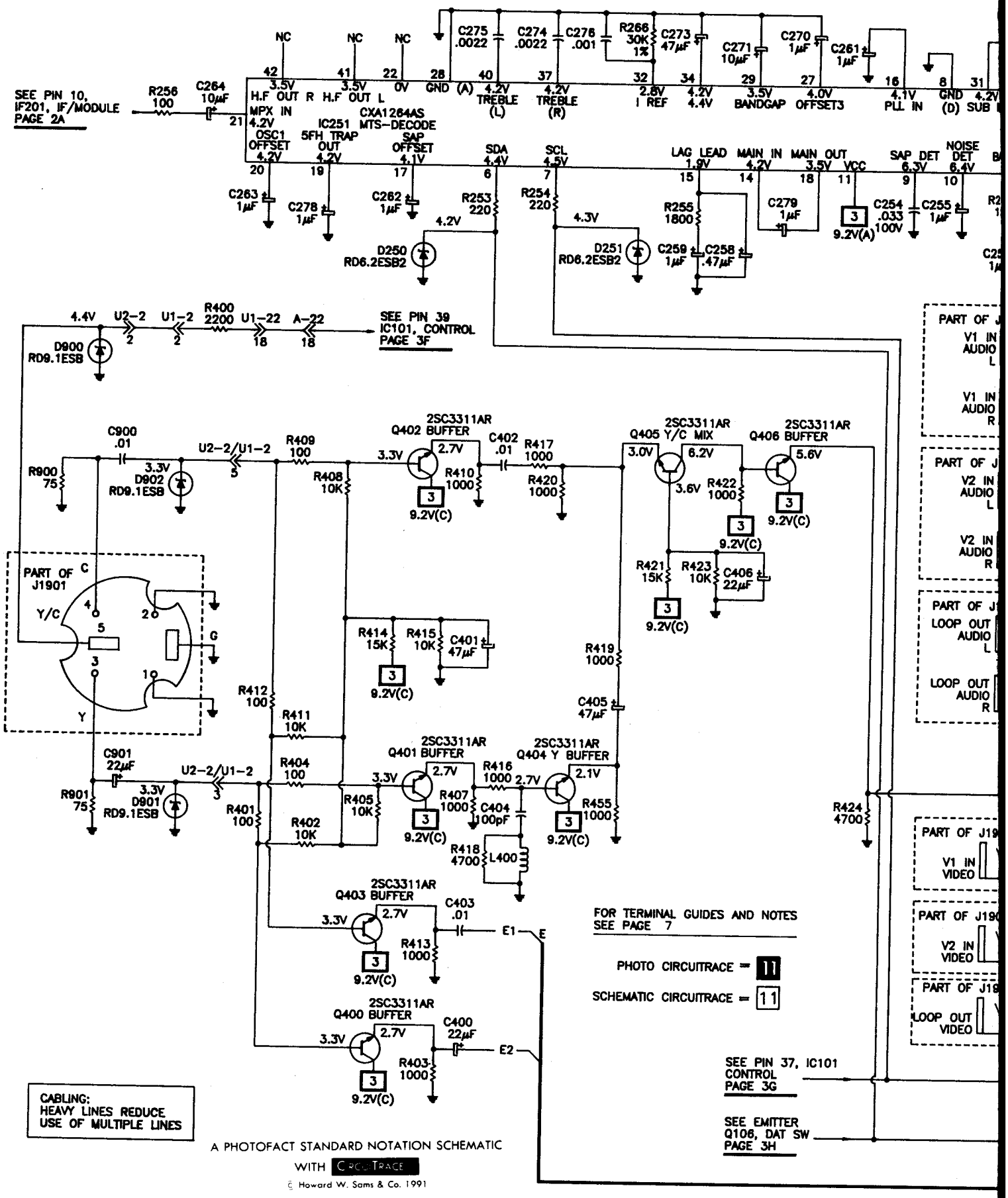
POWER SUPPLY SCHEMATIC continued



A

MTS / DECO



A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

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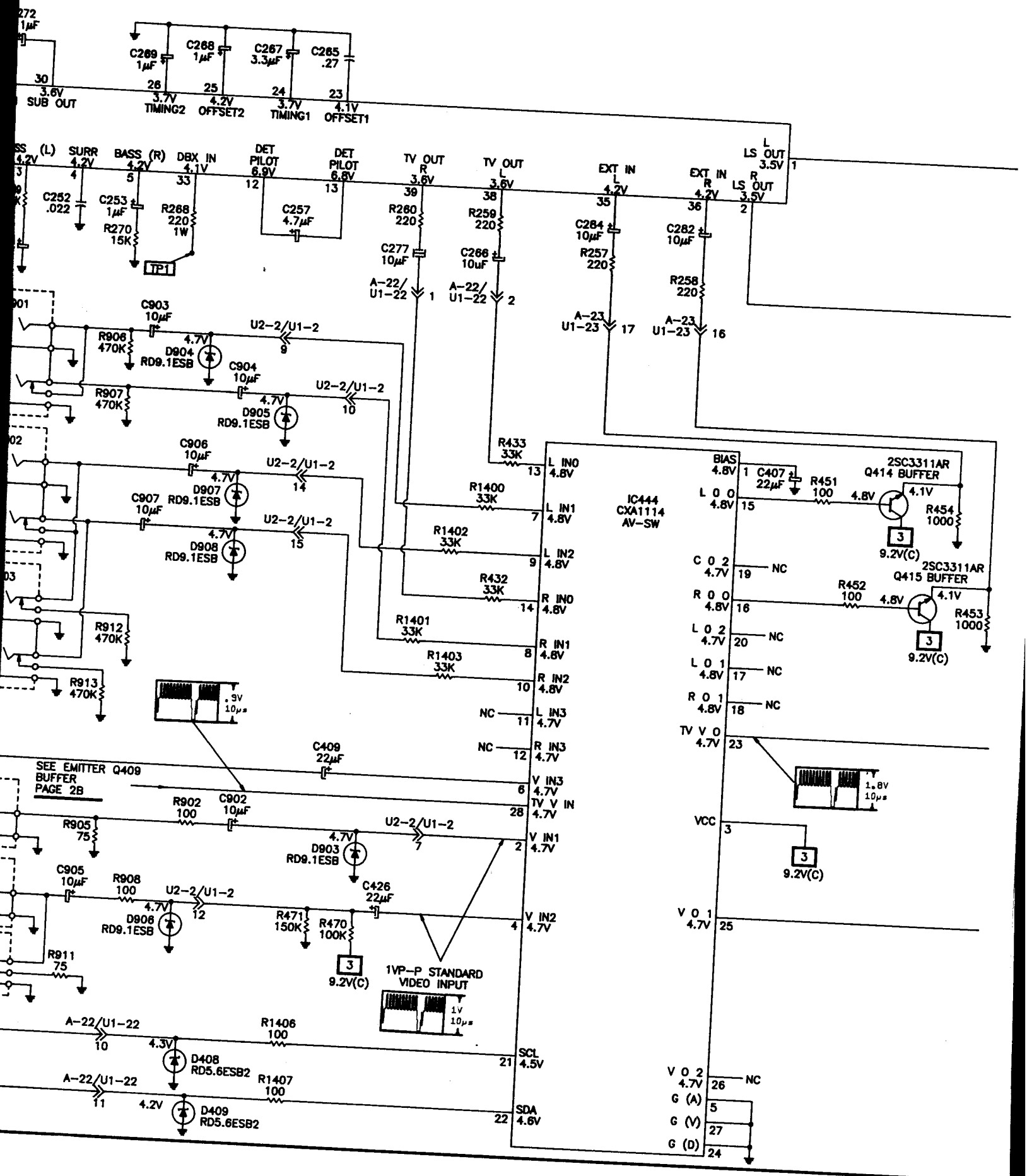
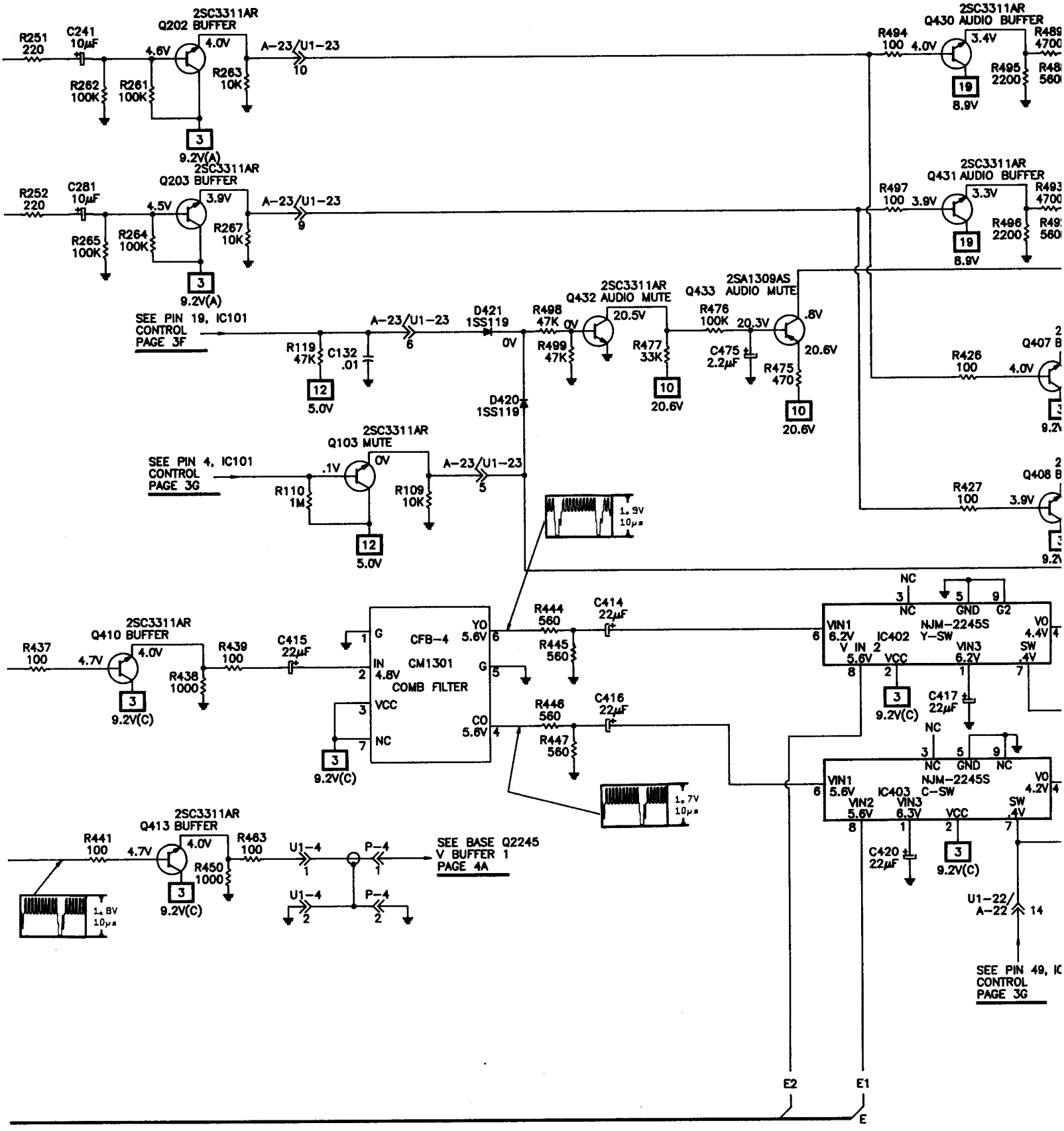
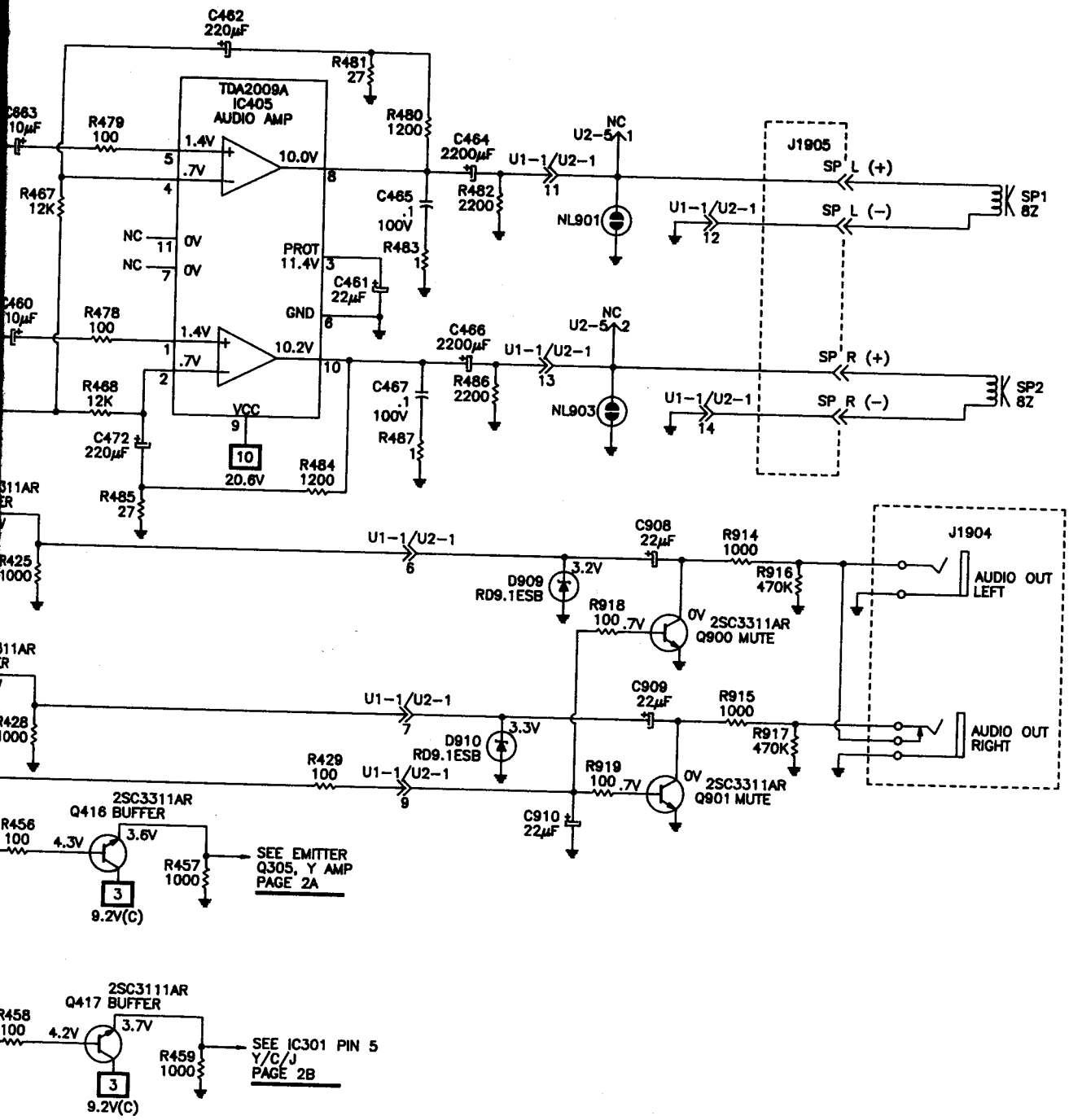
ER SCHEMATIC

B




2SC3311AR
Q202 BUFFER
R251 220
C241 10µF
4.6V
4.0V
R263 10K
R262 100K
R261 100K
A-23/U1-23
10
3
9.2V(A)
2SC3311AR
Q203 BUFFER
R252 220
C281 10µF
4.5V
3.9V
R267 10K
R265 100K
R264 100K
A-23/U1-23
9
3
9.2V(A)
2SC3311AR
Q430 AUDIO BUFFER
R494 100 4.0V
3.4V
R495 2200
19
8.9V
2SC3311AR
Q431 AUDIO BUFFER
R497 100 3.9V
3.3V
R496 2200
19
8.9V
SEE PIN 19, IC101
CONTROL
PAGE 3F
R119 47K
C132 .01
12
5.0V
A-23/U1-23
6
D421 1SS119
0V
R498 47K 0V
2SC3311AR
Q432 AUDIO MUTE
20.5V
R499 47K
R477 33K
10
20.6V
R476 100K 20.3V
2SA1309AS
Q433 AUDIO MUTE
.8V
20.6V
C475 2.2µF
R475 470
10
20.6V
D420 1SS119
R426 100
4.0V
Q407 B
9.2V
2SC3311AR
Q103 MUTE
SEE PIN 4, IC101
CONTROL
PAGE 3G
.1V
0V
R110 1M
R109 10K
A-23/U1-23
5
12
5.0V
1.9V
10µs
R427 100
3.9V
Q408 B
9.2V
2SC3311AR
Q410 BUFFER
R437 100
4.7V
4.0V
R438 1000
R439 100
3
9.2V(C)
C415 22µF
G
CFB-4
CM1301
COMB FILTER
IN 4.8V
VCC
NC
YO 5.6V
CO 5.6V
R444 560
R445 560
C414 22µF
R446 560
R447 560
C416 22µF
3
9.2V(C)
1.7V
10µs
NC
NJM-2245S
Y-SW
IC402
VIN1 6.2V
V IN 2 5.6V
VCC
VIN3 6.2V
SW .4V
VO 4.4V
GND
G2
3
9.2V(C)
C417 22µF
NJM-2245S
C-SW
IC403
VIN1 5.6V
VIN2 5.6V
VIN3 6.3V
VCC
SW .4V
VO 4.2V
C420 22µF
3
9.2V(C)
2SC3311AR
Q413 BUFFER
R441 100
4.7V
4.0V
R450 1000
R463 100
3
9.2V(C)
1.8V
10µs
U1-4
P-4
SEE BASE Q2245
V BUFFER 1
PAGE 4A
U1-22/
A-22
14
SEE PIN 49, IC
CONTROL
PAGE 3G
E2
E1
E


C462 220µF
R481 27
TDA2009A IC405 AUDIO AMP
R479 100
R480 1200
C464 2200µF
U2-5 NC 1
U1-1/U2-1
J1905
SP L (+)
SP L (-)
SP1 8Z
R467 12K
C465 .1 100V
R482 2200
NL901
U1-1/U2-1 12
R483 1
NC 11 0V
NC 7 0V
PROT 11.4V 3
C461 22µF
GND 6
1.4V .7V 10.0V
5 4 8
R478 100
C466 2200µF
U2-5 NC 2
U1-1/U2-1 13
SP R (+)
SP R (-)
SP2 8Z
R468 12K
C467 .1 100V
R486 2200
NL903
U1-1/U2-1 14
R487 1
1.4V .7V 10.2V
1 2 10
VCC 9
10 20.6V
C472 220µF
R484 1200
R485 27
C908 22µF
R914 1000
J1904
U1-1/U2-1 6
D909 RD9.1ESB 3.2V
R916 470K
AUDIO OUT LEFT
R918 100 .7V
0V 2SC3311AR Q900 MUTE
C909 22µF
R915 1000
U1-1/U2-1 7
D910 RD9.1ESB 3.3V
R917 470K
AUDIO OUT RIGHT
R429 100
U1-1/U2-1 9
R919 100 .7V
0V 2SC3311AR Q901 MUTE
C910 22µF
2SC3311AR Q416 BUFFER
R456 100
4.3V
3.6V
R457 1000
SEE EMITTER Q305, Y AMP PAGE 2A
3
9.2V(C)
2SC3111AR Q417 BUFFER
R458 100
4.2V
3.7V
R459 1000
SEE IC301 PIN 5 Y/C/J PAGE 2B
3
9.2V(C)

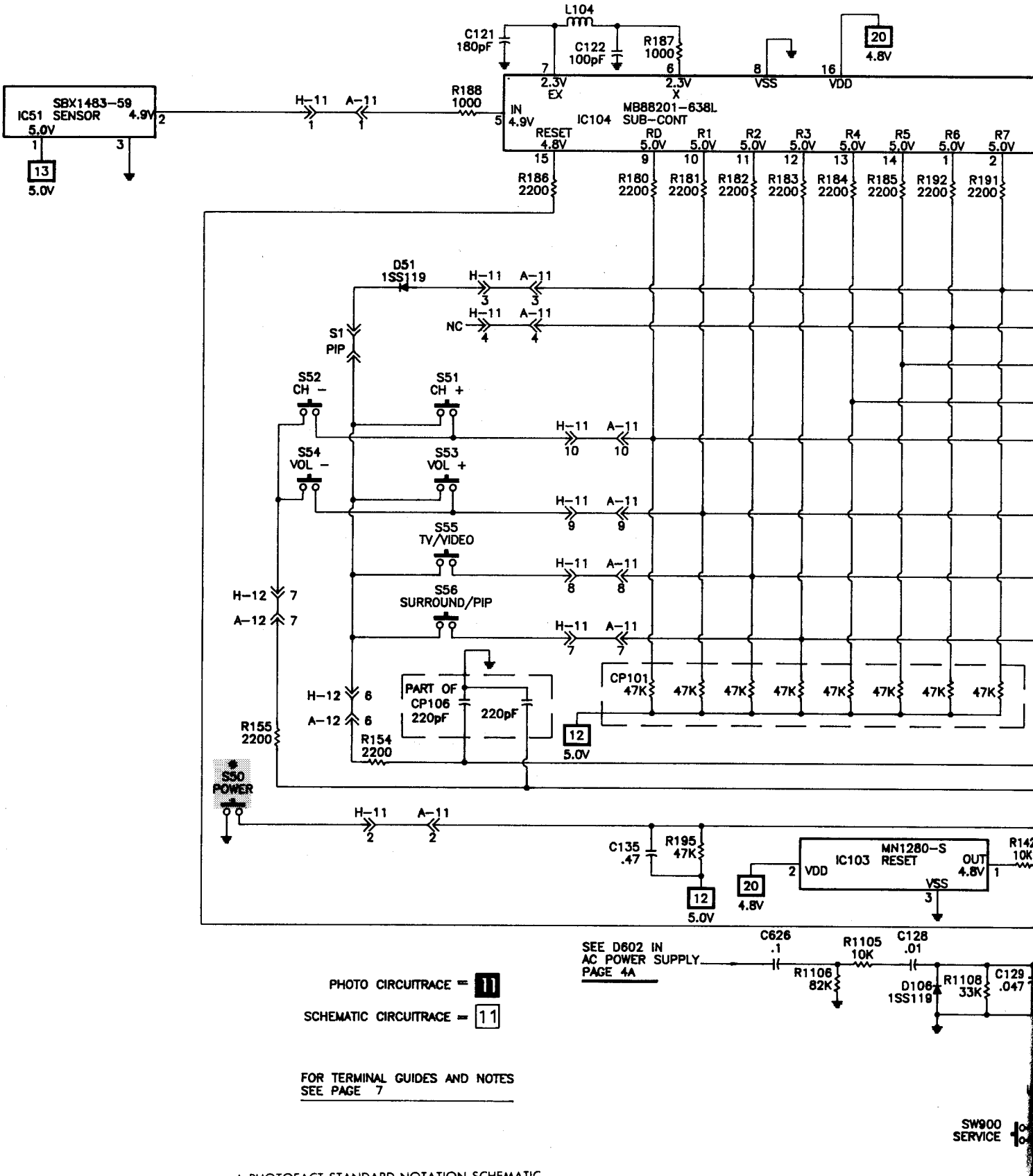


PHOTO CIRCUITRACE = 11

SCHEMATIC CIRCUITRACE = 11

FOR TERMINAL GUIDES AND NOTES SEE PAGE 7

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE

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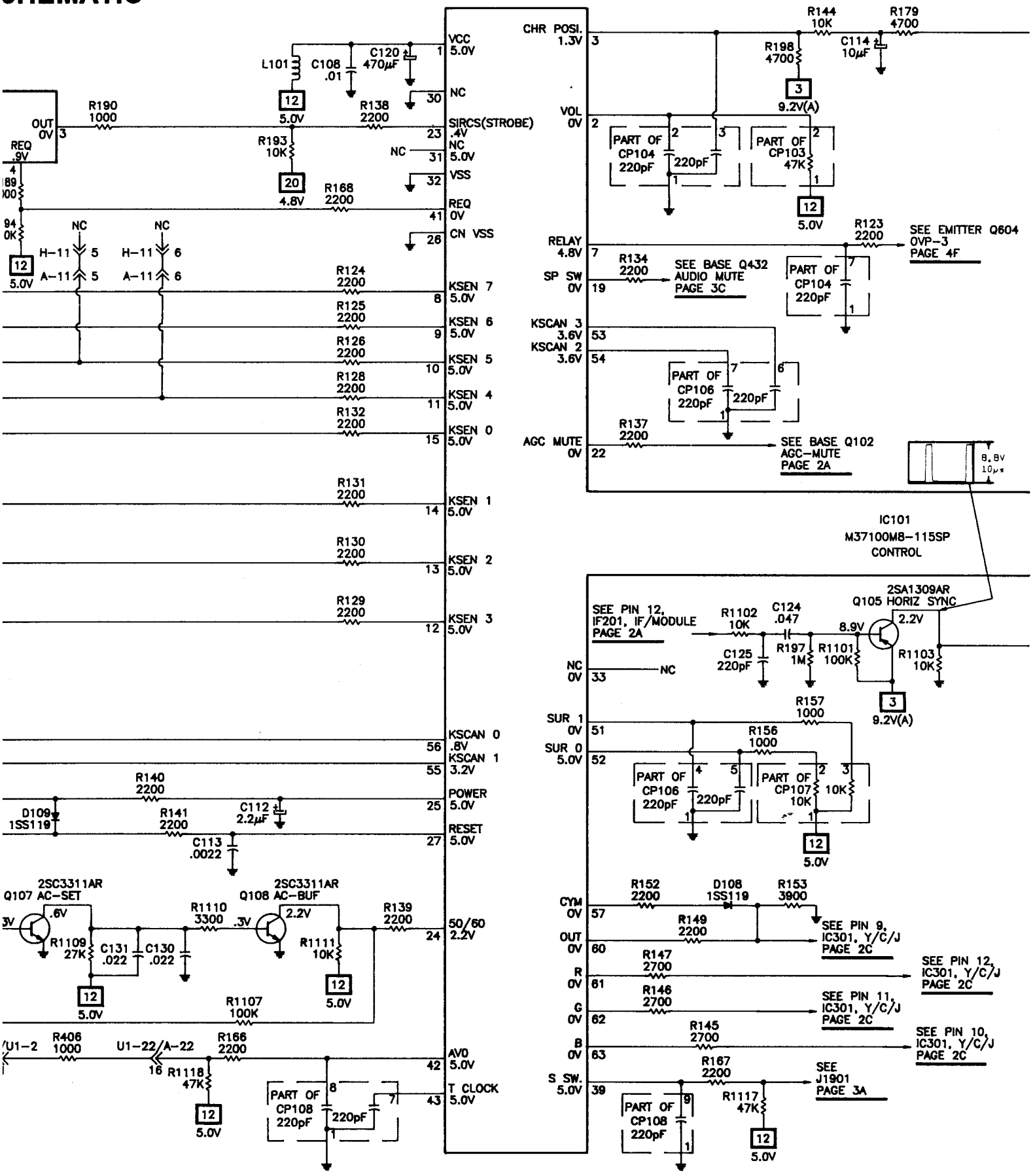
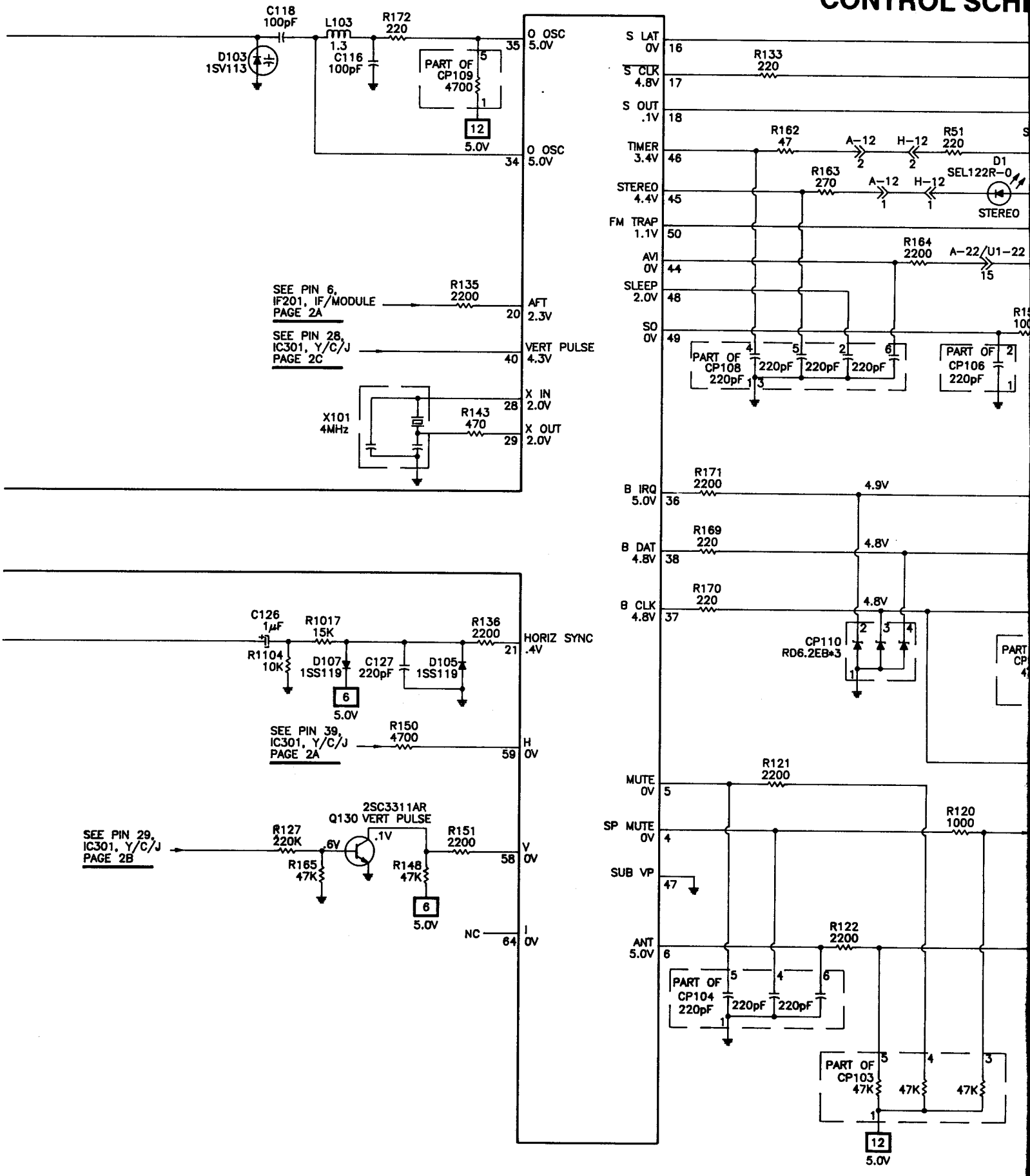
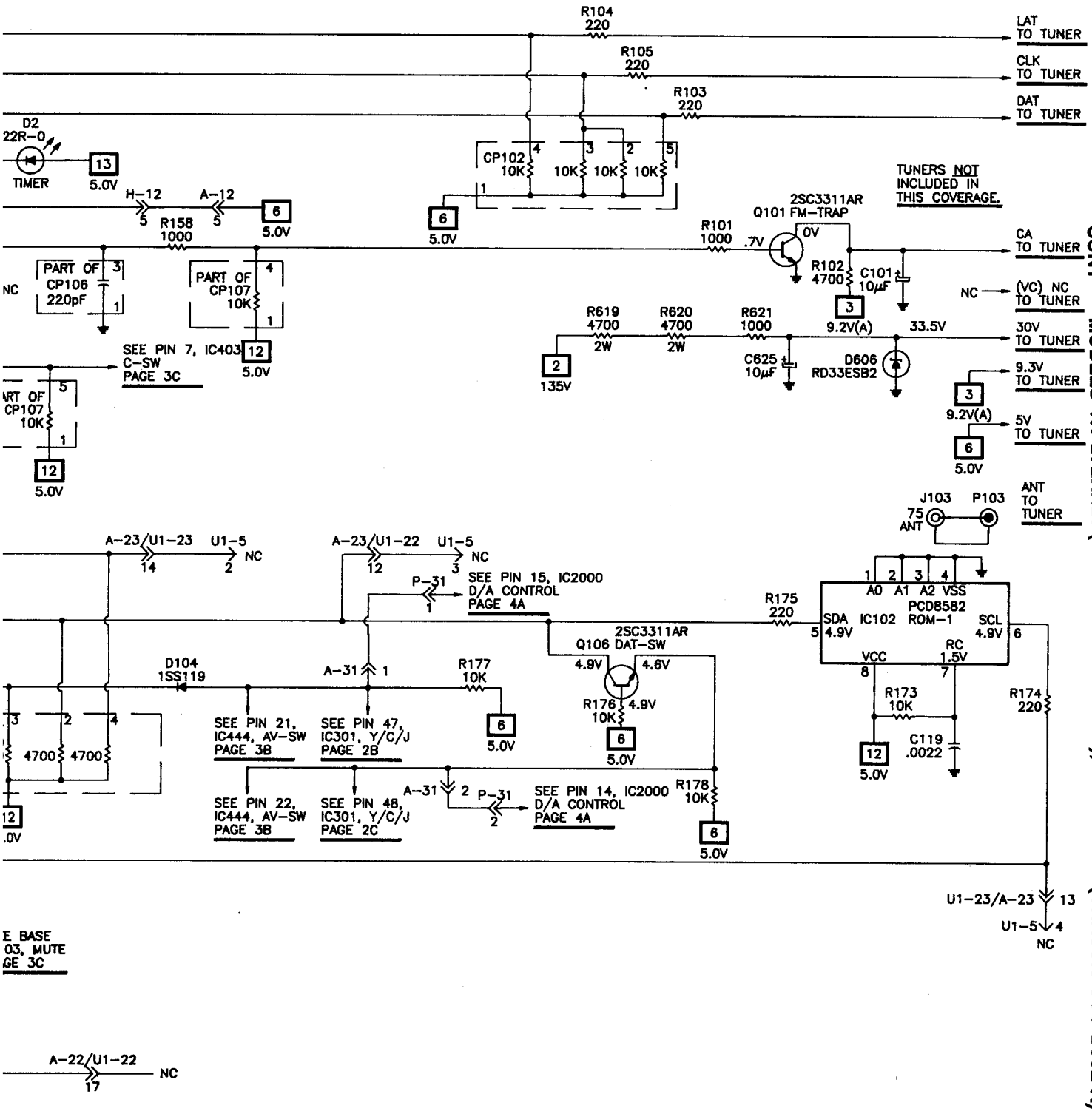
CHEMATIC


VCC 5.0V
NC
SIRCS(STROBE) .4V
NC 5.0V
VSS
REQ 0V
CN VSS
KSEN 7 5.0V
KSEN 6 5.0V
KSEN 5 5.0V
KSEN 4 5.0V
KSEN 0 5.0V
KSEN 1 5.0V
KSEN 2 5.0V
KSEN 3 5.0V
KSCAN 0 .8V
KSCAN 1 3.2V
POWER 5.0V
RESET 5.0V
50/60 2.2V
AVO 5.0V
T CLOCK 5.0V
CHR POSI. 1.3V
VOL 0V
RELAY 4.8V
SP SW 0V
KSCAN 3 3.6V
KSCAN 2 3.6V
AGC MUTE 0V
IC101
M37100M8-115SP
CONTROL
NC 0V
SUR 1 0V
SUR 0 5.0V
CYM 0V
OUT 0V
R 0V
G 0V
B 0V
S SW. 5.0V
SEE PIN 12, IF201, IF/MODULE PAGE 2A
SEE BASE Q432 AUDIO MUTE PAGE 3C
SEE BASE Q102 AGC-MUTE PAGE 2A
SEE EMITTER Q604 OVP-3 PAGE 4F
SEE PIN 9, IC301, Y/C/J PAGE 2C
SEE PIN 12, IC301, Y/C/J PAGE 2C
SEE PIN 11, IC301, Y/C/J PAGE 2C
SEE PIN 10, IC301, Y/C/J PAGE 2C
SEE J1901 PAGE 3A
2SC3311AR Q107 AC-SET
2SC3311AR Q108 AC-BUF
2SA1309AR Q105 HORIZ SYNC
PART OF CP104 220pF
PART OF CP103 47K
PART OF CP106 220pF
PART OF CP107 10K
PART OF CP108 220pF
9.2V(A)
8.9V
2.2V
5.0V
4.8V
8.8V 10μs

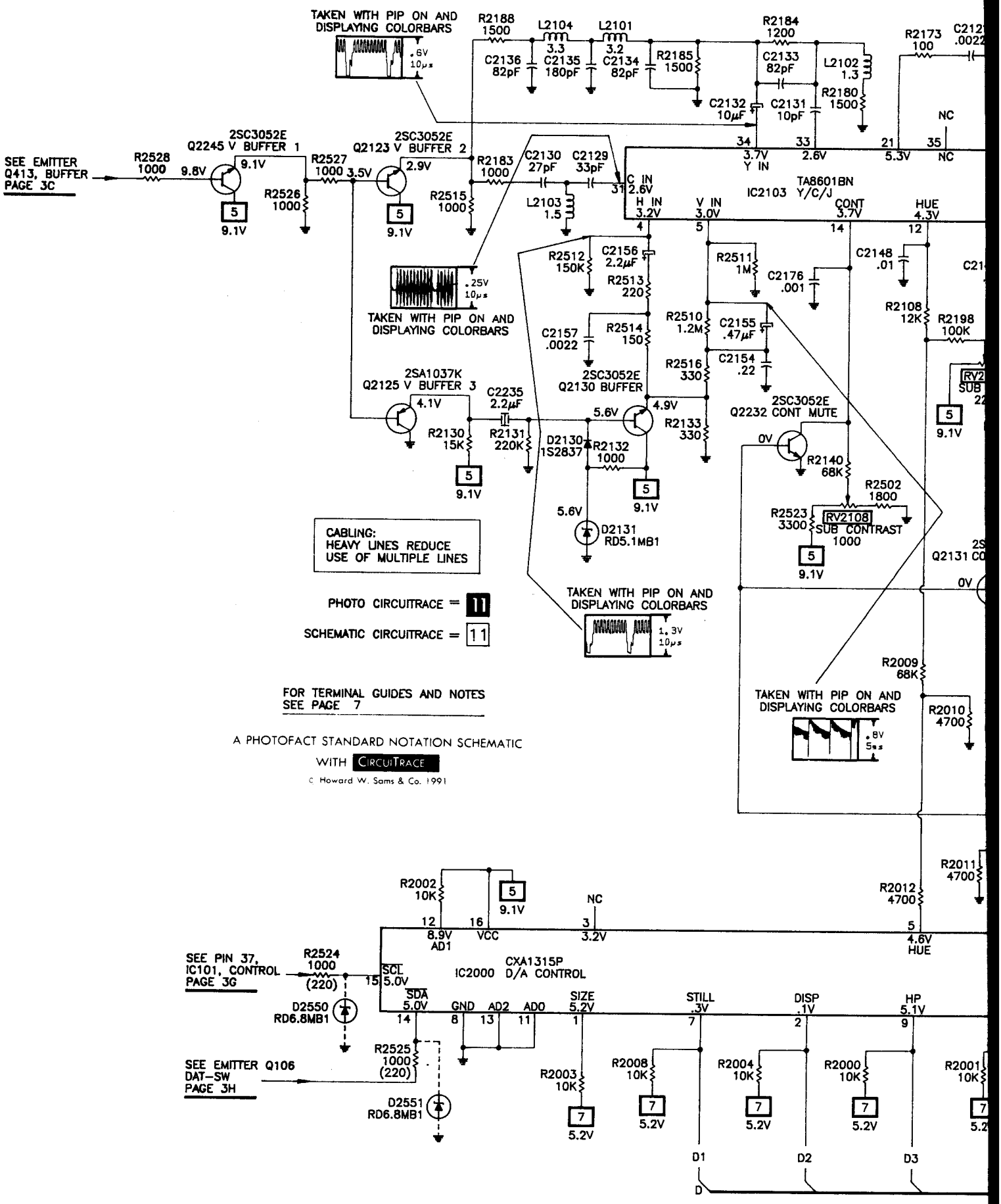

C118 100pF
L103 1.3
R172 220
C116 100pF
D103 1SV113
PART OF CP109 4700
12 5.0V
35 O OSC 5.0V
34 O OSC 5.0V
SEE PIN 6, IF201, IF/MODULE PAGE 2A
R135 2200
20 AFT 2.3V
SEE PIN 28, IC301, Y/C/J PAGE 2C
40 VERT PULSE 4.3V
X101 4MHz
R143 470
28 X IN 2.0V
29 X OUT 2.0V
S LAT 0V 16
S CLK 4.8V 17
S OUT .1V 18
TIMER 3.4V 46
STEREO 4.4V 45
FM TRAP 1.1V 50
AVI 0V 44
SLEEP 2.0V 48
SO 0V 49
R133 220
R162 47
R163 270
R164 2200
R51 220
D1 SEL122R-0
STEREO
A-12
H-12
A-22/U1-22
PART OF CP108 220pF 220pF 220pF 220pF
PART OF CP106 220pF
B IRQ 5.0V 36
B DAT 4.8V 38
B CLK 4.8V 37
R171 2200
R169 220
R170 220
4.9V
4.8V
CP110 RD6.2EB*3
C126 1µF
R1017 15K
R1104 10K
D107 1SS119
C127 220pF
D105 1SS119
R136 2200
6 5.0V
21 HORIZ SYNC .4V
SEE PIN 39, IC301, Y/C/J PAGE 2A
R150 4700
59 H 0V
SEE PIN 29, IC301, Y/C/J PAGE 2B
2SC3311AR Q130 VERT PULSE
R127 220K
R165 47K
R148 47K
R151 2200
.6V
.1V
58 V 0V
NC
64 I 0V
MUTE 0V 5
SP MUTE 0V 4
SUB VP 47
ANT 5.0V 6
R121 2200
R120 1000
R122 2200
PART OF CP104 220pF 220pF 220pF 220pF
PART OF CP103 47K 47K 47K
12 5.0V



SONY MODELS KV-27EXR25 (CHASSIS SCC-D50F-A), KV-27EXR20 (CHASSIS SCC-D50E-A)

A

PIP SC



FOR TERMINAL GUIDES AND NOTES SEE PAGE 7

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE

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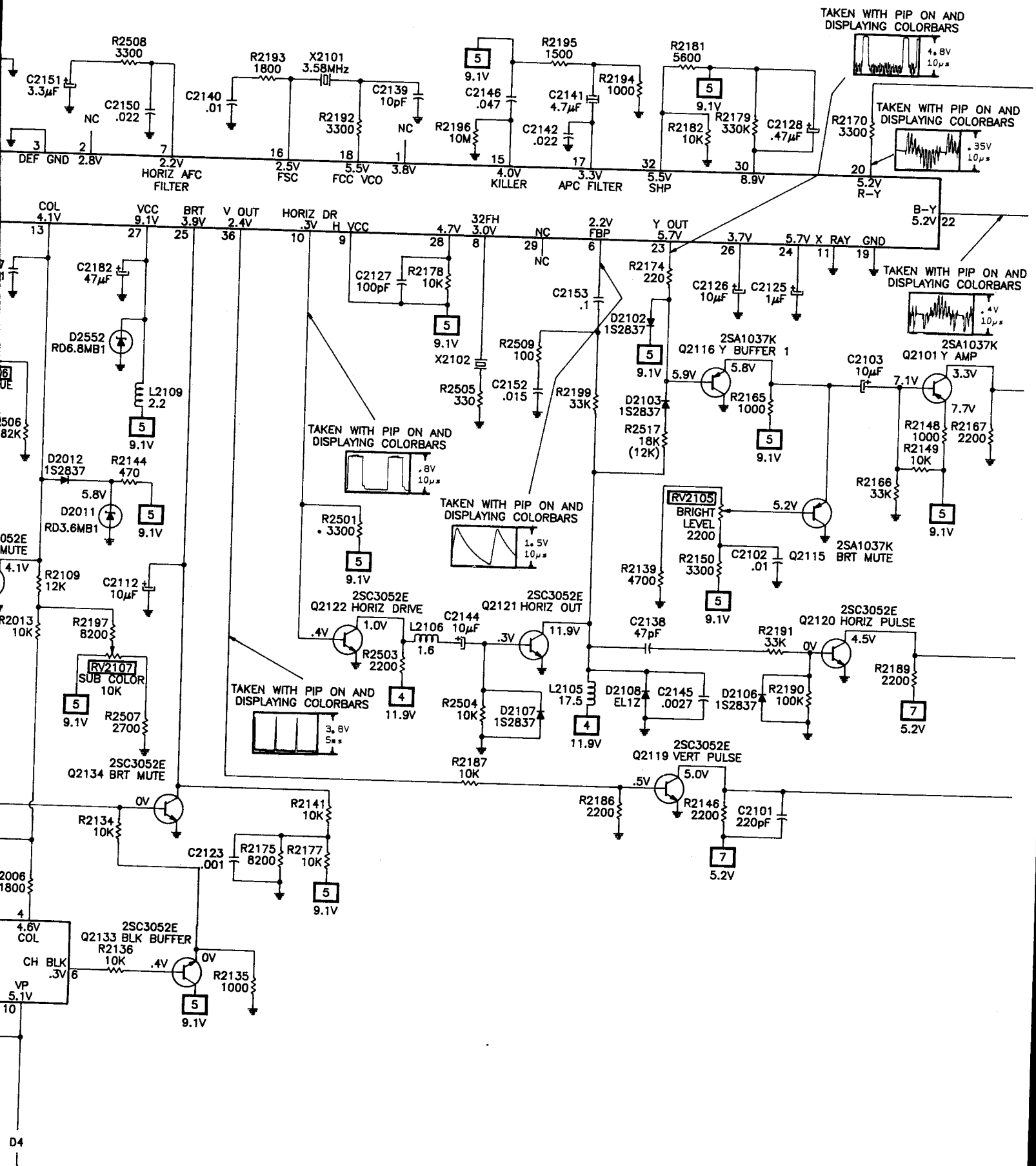
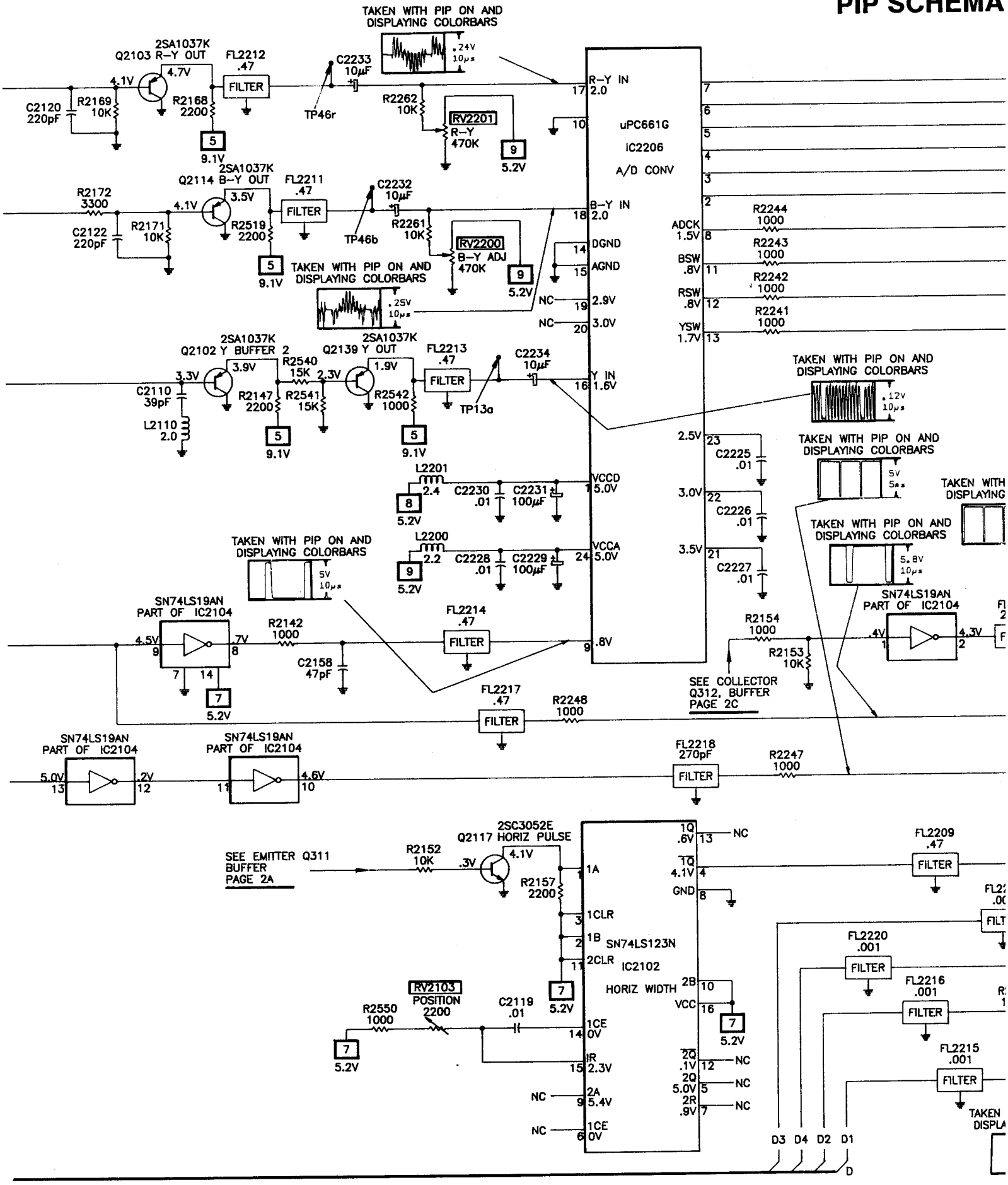
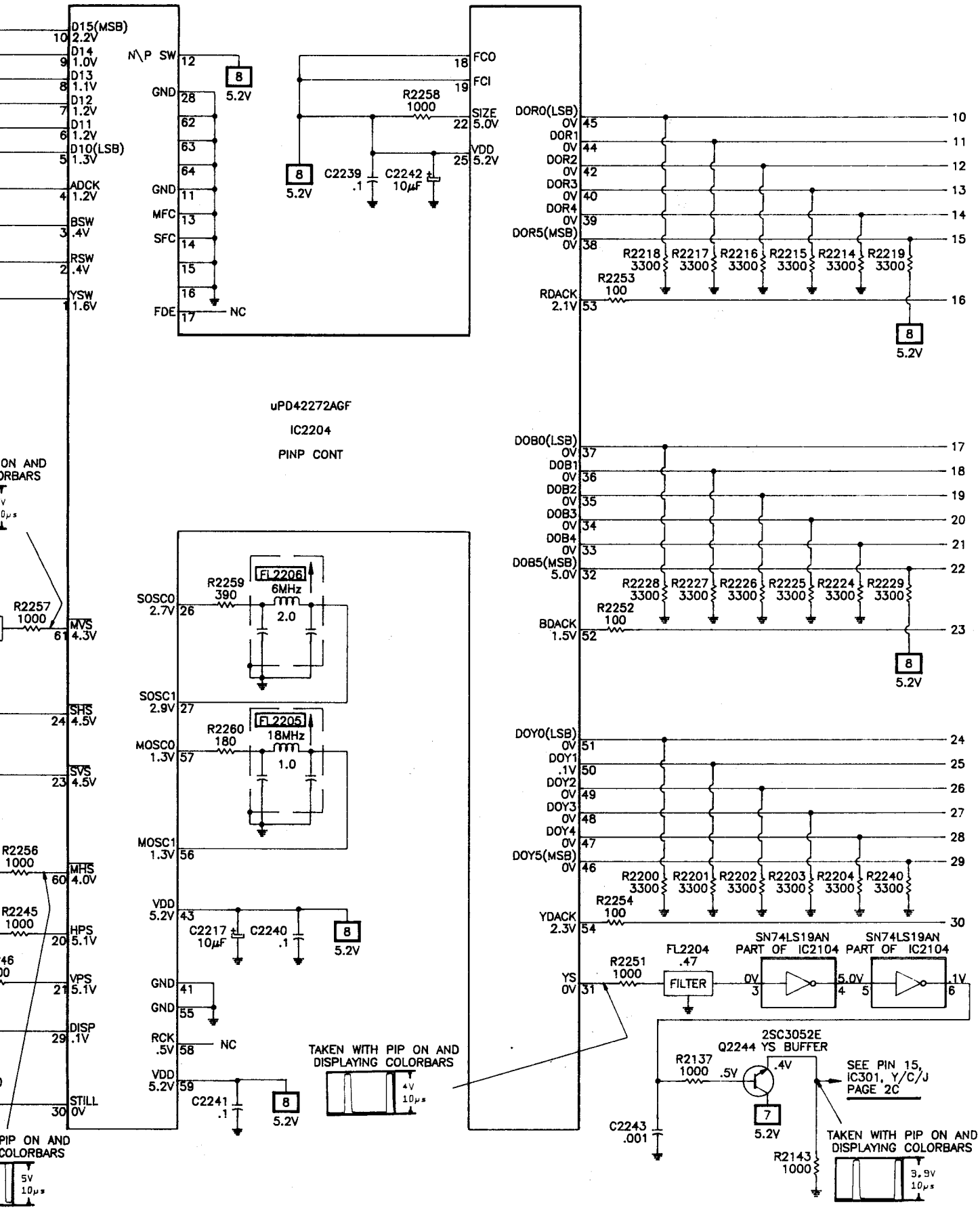
HEMATIC

B


R2508 3300
C2151 3.3µF
C2150 .022
NC
C2140 .01
R2193 1800
X2101 3.58MHz
C2139 10pF
R2192 3300
NC
C2146 .047
R2195 1500
R2194 1000
C2141 4.7µF
R2196 10M
C2142 .022
R2181 5600
R2182 10K
R2179 330K
C2128 .47µF
R2170 3300
DEF GND 2.8V
HORIZ AFC FILTER 2.2V
FSC 2.5V
FCC VCO 5.5V
3.8V
KILLER 4.0V
APC FILTER 3.3V
SHP 5.5V
8.9V
R-Y 5.2V
TAKEN WITH PIP ON AND DISPLAYING COLORBARS
COL 4.1V
VCC 9.1V
BRT 3.9V
V OUT 2.4V
HORIZ DR .3V
H VCC
32FH 3.0V
NC
FBP 2.2V
Y OUT 5.7V
3.7V
5.7V X RAY
GND
B-Y 5.2V
C2182 47µF
D2552 RD6.8MB1
L2109 2.2
C2127 100pF
R2178 10K
X2102
R2509 100
C2152 .015
R2505 330
C2153 .1
D2102 1S2837
R2174 220
C2126 10µF
C2125 1µF
2SA1037K Q2116 Y BUFFER 1
D2103 1S2837
R2517 18K (12K)
R2165 1000
R2199 33K
C2103 10µF
2SA1037K Q2101 Y AMP
R2148 1000
R2149 10K
R2167 2200
R2166 33K
D2012 1S2837
R2144 470
D2011 RD3.6MB1
R2501 3300
RV2105 BRIGHT LEVEL 2200
2SA1037K BRT MUTE
R2150 3300
C2102 .01
Q2115
R2139 4700
C2112 10µF
R2109 12K
2SC3052E Q2122 HORIZ DRIVE
2SC3052E Q2121 HORIZ OUT
C2144 10µF
L2106 1.6
R2503 2200
C2138 47pF
2SC3052E Q2120 HORIZ PULSE
R2191 33K
R2189 2200
R2013 10K
R2197 8200
RV2107 SUB COLOR 10K
R2507 2700
R2504 10K
D2107 1S2837
L2105 17.5
D2108 EL1Z
C2145 .0027
D2106 1S2837
R2190 100K
R2187 10K
2SC3052E Q2134 BRT MUTE
2SC3052E Q2119 VERT PULSE
R2186 2200
R2146 2200
C2101 220pF
R2134 10K
R2141 10K
C2123 .001
R2175 8200
R2177 10K
2SC3052E Q2133 BLK BUFFER
R2136 10K
R2135 1000
CH BLK .3V
VP 5.1V
D4

PIP SCHEMA


TAKEN WITH PIP ON AND DISPLAYING COLORBARS
2SA1037K Q2103 R-Y OUT
FL2212 .47
FILTER
C2233 10µF
TP46r
R2262 10K
RV2201 R-Y 470K
C2120 220pF
R2169 10K
R2168 2200
4.1V
4.7V
9.1V
5.2V
uPC661G IC2206 A/D CONV
R-Y IN 2.0
2SA1037K Q2114 B-Y OUT
FL2211 .47
C2232 10µF
TP46b
R2261 10K
RV2200 B-Y ADJ 470K
R2172 3300
C2122 220pF
R2171 10K
R2519 2200
3.5V
B-Y IN 2.0
DGND
AGND
NC 2.9V
NC 3.0V
ADCK 1.5V
BSW .8V
RSW .8V
YSW 1.7V
R2244 1000
R2243 1000
R2242 1000
R2241 1000
2SA1037K Q2102 Y BUFFER 2
2SA1037K Q2139 Y OUT
FL2213 .47
C2234 10µF
TP13a
R2540 15K
R2147 2200
R2541 15K
R2542 1000
C2110 39pF
L2110 2.0
3.3V
3.9V
2.3V
1.9V
Y IN 1.6V
2.5V
3.0V
3.5V
C2225 .01
C2226 .01
C2227 .01
L2201
C2230 .01
C2231 100µF
VCCD 5.0V
L2200
C2228 .01
C2229 100µF
VCCA 5.0V
SN74LS19AN PART OF IC2104
R2142 1000
C2158 47pF
FL2214 .47
FL2217 .47
R2248 1000
R2154 1000
R2153 10K
SEE COLLECTOR Q312, BUFFER PAGE 2C
SN74LS19AN PART OF IC2104
FL2218 270pF
R2247 1000
2SC3052E Q2117 HORIZ PULSE
SEE EMITTER Q311 BUFFER PAGE 2A
R2152 10K
R2157 2200
SN74LS123N IC2102
HORIZ WIDTH
1CLR
1B
2CLR
1A
1CE
IR
2A
1Q
2Q
2B
VCC
GND
RV2103 POSITION 2200
R2550 1000
C2119 .01
FL2209 .47
FL2220 .001
FL2216 .001
FL2215 .001
D3 D4 D2 D1
D


D15(MSB) 10 2.2V
D14 9 1.0V
D13 8 1.1V
D12 7 1.2V
D11 6 1.2V
D10(LSB) 5 1.3V
ADCK 4 1.2V
BSW 3 .4V
RSW 2 .4V
YSW 1 1.6V
N\P SW 12
GND 28
62
63
64
GND 11
MFC 13
SFC 14
15
16
FDE 17 NC
8 5.2V
FCO 18
FCI 19
R2258 1000
SIZE 22 5.0V
VDD 25 5.2V
C2239 .1
C2242 10µF
uPD42272AGF
IC2204
PINP CONT
DOR0(LSB) 0V 45
DOR1 0V 44
DOR2 0V 42
DOR3 0V 40
DOR4 0V 39
DOR5(MSB) 0V 38
R2218 3300
R2217 3300
R2216 3300
R2215 3300
R2214 3300
R2219 3300
R2253 100
RDACK 2.1V 53
10
11
12
13
14
15
16
DOB0(LSB) 0V 37
DOB1 0V 36
DOB2 0V 35
DOB3 0V 34
DOB4 0V 33
DOB5(MSB) 5.0V 32
R2228 3300
R2227 3300
R2226 3300
R2225 3300
R2224 3300
R2229 3300
R2252 100
BDACK 1.5V 52
17
18
19
20
21
22
23
DOY0(LSB) 0V 51
DOY1 .1V 50
DOY2 0V 49
DOY3 0V 48
DOY4 0V 47
DOY5(MSB) 0V 46
R2200 3300
R2201 3300
R2202 3300
R2203 3300
R2204 3300
R2240 3300
R2254 100
YDACK 2.3V 54
24
25
26
27
28
29
30
R2257 1000
MVS 61 4.3V
SHS 24 4.5V
SVS 23 4.5V
R2256 1000
MHS 60 4.0V
R2245 1000
HPS 20 5.1V
VPS 21 5.1V
DISP 29 .1V
STILL 30 0V
SOSC0 2.7V 26
R2259 390
FL2206 6MHz 2.0
SOSC1 2.9V 27
MOSC0 1.3V 57
R2260 180
FL2205 18MHz 1.0
MOSC1 1.3V 56
VDD 5.2V 43
C2217 10µF
C2240 .1
GND 41
GND 55
RCK .5V 58 NC
VDD 5.2V 59
C2241 .1
TAKEN WITH PIP ON AND DISPLAYING COLORBARS
4V 10µs
YS 0V 31
R2251 1000
FL2204 .47
FILTER
SN74LS19AN PART OF IC2104
SN74LS19AN PART OF IC2104
0V 3
5.0V 4 5
.1V 6
2SC3052E
Q2244 YS BUFFER
R2137 1000
.5V
.4V
C2243 .001
SEE PIN 15, IC301, Y/C/J PAGE 2C
TAKEN WITH PIP ON AND DISPLAYING COLORBARS
R2143 1000
3.9V 10µs
5V 10µs

MISCELLANEOUS ADJUSTMENTS

PRETUNING

Note: Use Remote Commander to accomplish prehming. All procedures require an antenna or cable connected, and power supplied to the set.

Auto Memory

1. Press the Auto Program button.

Add Channel

1. Select Channel.
2. Press Add button.
3. Repeat steps one and two to add other channels.

Delete Channel

1. Select Channel.
2. Press Erase button.
3. Repeat steps one and two to erase other channels.

Guide Function

1. Press the Guide button to select Time, Timer, and Channel Block.
2. Select function by pressing guide button until desired function is highlighted. Press Enter button.
3. Follow the displayed instructions.

Sleep

1. Press Sleep button. The set will turn off automatically in approximately one hour.
2. To cancel sleep timer, press Sleep button until Sleep Off is indicated or turn set off.

Note: This set employs digital customer controls. Use the Remote Commander to accomplish digital adjustments. Unless specified all adjustments are accomplished with controls in reset position.

DIGITAL ADJUSTMENT PROCEDURES

Entering Service Adjustment Mode

1. Tune in a picture, and turn set off.
2. Insert a small tuning tool in service mode access hole, located to the left of the right speaker connections on the back of the set. While depressing Service Button (SW900), turn set on.

Making Adjustments

1. Enter service mode.
2. Select adjustment by pressing the the 1 and 4 buttons.
3. Make changes on selected adjustment by pressing the 3 and 6 button.

Saving Adjustments to Memory

1. Adjustments must be saved to memory.
2. To save adjustment, press the Mute button and then the Enter button.

Memory Write Confirmation

1. Disconnect AC plug from outlet.
2. Plug set in and enter Service Adjustment Mode.
3. Select adjustment and confirm that setting was saved to memory.

Exiting Service Adjustment Mode

1. Turn set off and then back on.

Adjustments Required When Replacing IC's

1. IC102: VSOM, AFC, REF, ROFF, GOFF, BOFF, ABLM, TEST, DRGB.
2. IC251: MPX, FILO, DEEM, STEV, SAPV, PILO, SEP, VD, LVOL, RVOL.
3. IC101: DISP
4. IC301: HFRE, VFRE, VPOS, VSIV, VLIN, VSCO, HPOS, HSIZ, PAMP, CPIN, PPHA, VCOM, GAMP, BAMP, GCUT, BCUT, CROM, SPIX, SHUE, SCOL, SBRT, RGBP, VSOM, AFC, REF, ROFF, GOFF, BOFF, ABLM.

VSMO, AFC, REF, ROFF, GOFF, BOFF, ABLM, TEST, DRGB

The following adjustments have the listed initial settings. Save each adjustment to memory before performing the next one. Enter the Service Adjustment Mode. Adjust the level of VSOM to 00, AFC to 00, REF to 02, ROFF to 01, GOFF to 01, BOFF to 01, ABLM to 01, TEST to 00, DRGB to 01.

DISPLAY POSITION (DISP)

Enter the Service Adjustment Mode. Select DISP adjustment. Adjust the level to center the display 2 1/2 inches on either side. Save adjustment to memory.

HORIZONTAL FREQUENCY (HFRE)

Tune in a colorbar pattern. Enter the Service Adjustment Mode. Select the AFC Adjustment and set the AFC to 03. Horizontal will lose sync. Select HFRE adjustment. Adjust the level until the picture locks in. Save adjustment to memory. Select AFC adjustment and set level to 00. Save adjustment to memory.

PIP ADJUSTMENTS

Note: Adjustments made with PIP on. Refer to "Digital Adjustment Procedure" in Miscellaneous Adjustment Section.

PIP BRIGHTNESS AND CONTRAST

Tune in a picture. Set Brightness, Color, and Picture to MINIMUM. Adjust Bright Level Control (RV2 105) for just visible highlights. Set Picture and Brightness to Maximum and adjust Contrast **(RV2108)** for minimum blooming. Set Picture, Brightness, and Color to reset.

PIP WINDOW POSITION

Tune in a picture. Place PIP window in upper left comer of **screen.** Adjust Position Control **(RV2103)** to place PIP window 1 inch from left side of screen. Place PIP window in lower right comer of screen. Adjust Position Control **(RV2103)** to place PIP window 1 inch from right side of screen.

PIP SUB COLOR/SUB TINT

Tune in a **colorbar** pattern on the PIP screen. On main screen select a video input with no signal. Position PIP screen in lower left comer of screen. Connect an oscilloscope to **TP47B.** Adjust Sub Color Control (RV2 107) so that the PIP portion of the signal is **1.9V** p-p. Tune in a picture on PIP window. Adjust Sub Hue Control **(RV2106)** to obtain proper skin tones.

PIP RGB PICTURE (RGBP)

Tune in a **colorbar** Pattern. Enter Service Adjustment Mode. Select RGBP adjustment, and adjust level to 00. Set Picture and Brightness to MINIMUM. Adjust RGBP for proper colorbars in PIP window. Save adjustment to memory.

PIP B-Y

Tune in a **colorbar** pattern. Turn B-Y Control **(RV2200)** clockwise until PIP window turns solid blue and note position. Turn **RV2200 counterclockwise** until PIP window colorbars lose blue and note position. Set **RV2200** to midpoint between the two positions.

PIP R-Y

Tune in a **colorbar** pattern. Turn R-Y Control **(RV2201)** counter-clockwise until PIP window turns solid red and note position. Turn **RV2201** clockwise until PIP window colorbars lose red and note position. Set **RV2201** to midpoint between the two positions.

SUB PICTURE

Tune in a **colorbar** pattern on the PIP window. Adjust LC Networks **(FL2205, FL2206)** so that the PIP window size and location is identical in all positions.

MISCELLANEOUS ADJUSTMENTS continued

HORIZONTAL SIZE (HSIZ)

Tune in a crosshatch pattern. Enter the Service Adjustment Mode. Select HSIZ, and adjust level for slight horizontal overscan. Save adjustment to memory.

HORIZONTAL CENTER (HPOS)

Perform Horizontal Frequency Adjustment. Tune in a crosshatch pattern. Adjust Horizontal Centering Connector (A-55) for best horizontal centering. Enter the Service Adjustment Mode. Select HPOS, and adjust level for best horizontal centering. Save adjustment to memory.

PINCUSHION (PAMP, CPIN, PPHA)

Tune in a crosshatch pattern. Enter the Service Adjustment Mode. Select PAMP, and adjust level for straight vertical lines at left and right of screen. Save adjustment to memory. Select CPIN, and adjust level for straight vertical lines at top and bottom of screen. Save adjustment to memory. Select PPHA, and adjust level for equal spacing of vertical lines from top to bottom of screen. Save adjustment to memory.

VERTICAL FREQUENCY (VFRE)

Tune in a colorbar pattern. Enter the Service Adjustment Mode. Select VFRE adjustment, and adjust the level until the picture locks in. Save adjustment to memory.

VERTICAL SIZE (VSIZ)

Tune in a crosshatch pattern. Enter the Service Adjustment Mode. Select VSIZ, and adjust level for slight vertical overscan. Save adjustment to memory.

VERTICAL POSITION (VPOS)

Tune in a crosshatch pattern. Enter the Service Adjustment Mode: Select VPOS, and adjust level to center picture vertically. Save adjustment to memory.

VERTICAL LINEARITY (VLIN)

Tune in a crosshatch pattern. Enter the Service Adjustment Mode. Select VLIN, and adjust level for equal vertical spacing of pattern. Save adjustment to memory.

VERTICAL COMP (VCOM)

Enter the Service Adjustment Mode. Select VCOM, and adjust level to 02. Save adjustment to memory.

CHROMA TRAP (CROM)

Tune in a colorbar pattern. Set Color to Maximum, and turn NOTCH on. Connect an oscilloscope to TP47R (On C-Board). Enter the Service Adjustment Mode. Select CROM, and adjust level for MINIMUM chroma. Save adjustment to memory.

SUB BRIGHTNESS (SBRT)

Tune in a crosshatch pattern. Set Picture and Brightness to MINIMUM. Enter the Service Adjustment Mode. Select SBRT, and adjust level for visible highlights. Save adjustment to memory.

SUB CONTRAST (SPIX)

Tune in a crosshatch pattern. Enter the Service Adjustment Mode. Select SPIX, and adjust level for best picture. Check tracking by adjusting Picture and Brightness to MINIMUM and Maximum and check for blooming. Readjust if necessary. Save adjustment to memory.

SUB HUE AND SUB COLOR (SHUE, SCOL)

Tune in a colorbar pattern. Connect an oscilloscope to TP47B (On C-Board). Enter the Service Adjustment Mode. Select SCOL, and adjust level for 3.5V p-p. Tune in an active channel. Select SHUE, and adjust level for proper skin tones. Save adjustment to memory.

S - CORRECTION (VSCO)

Enter the Service Adjustment Mode. Select VSCO, and adjust level to 0. Save adjustment to memory.

COLOR PURITY

Use a degaussing coil to demagnetize the CRT and mounting brackets. Enter the Service Adjustment Mode. Adjust ROFF and BOFF levels to MINIMUM. Adjust GOFF for a green raster. Loosen Deflection Yoke clamp screw and slide it backward to obtain a vertical green band. Adjust purity rings to center the vertical green band. Slide the Deflection Yoke forward until a uniform green screen is obtained. Check Blue and Red purity by adjusting the ROFF, GOFF, and BOFF levels. Return all controls and adjustments to normal levels.

MISCELLANEOUS ADJUSTMENTS continued

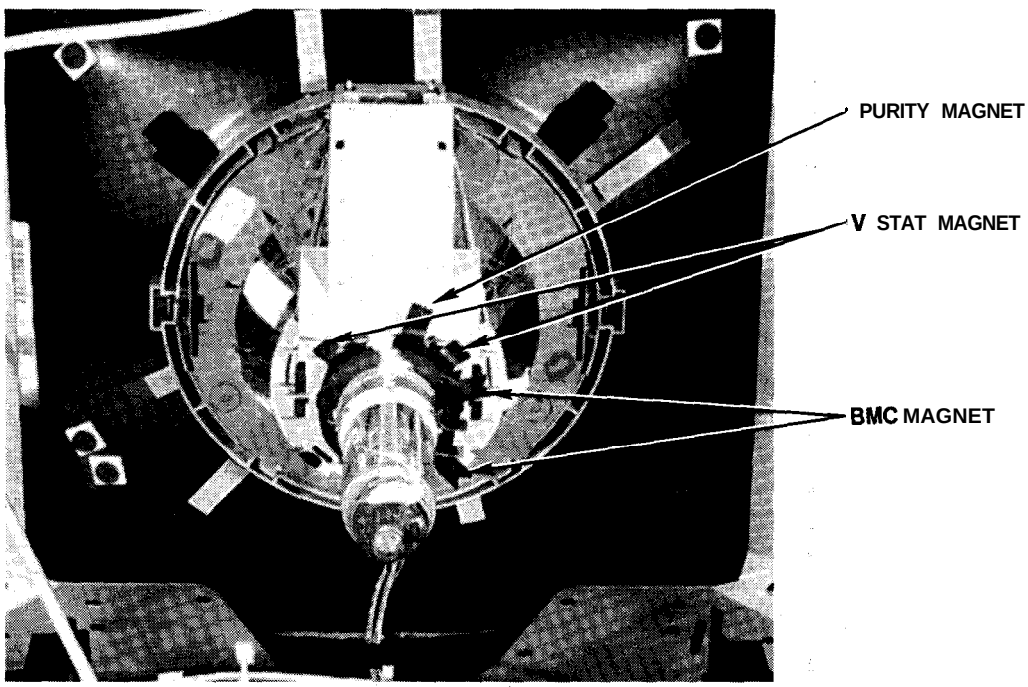
COLOR TEMPERATURE (BCUT, GCUT, GAMP, BAMP)

Adjust G2 Control (RV701) so that the retrace lines just disappear. Tune in a crosshatch pattern. Enter the Service Adjustment Mode. Set Picture to MINIMUM. Select SBRT adjustment, and adjust level for MINIMUM. Select GCUT and BCUT adjustments and adjust levels for best white balance. Save adjustment to memory. Set Picture to Maximum. Select GAMP and BAMP adjustments and adjust levels for best white balance. Save adjustment to memory. Perform Sub Brightness Adjustment.

CONVERGENCE

Adjust the Focus, Horizontal Size, Vertical Size, and Vertical Linearity. Tune in a dot pattern. Adjust the Horizontal Static Control (RV702) to converge the Red and Blue dots over the Green dots horizontally at the center of the screen. Rotate the Vertical Static Magnets to converge the Red and Blue dots over the Green dots vertically at the center of the screen. NOTE: Some versions use a BMC magnet. To adjust the BMC magnet, slide it in and out to correct for insufficient horizontal static convergence, rotate the BMC magnet to correct for insufficient vertical static convergence. Tune in a crosshatch pattern and loosen the Delection Yoke (L550) screw. Remove the rubber wedges between the Deflection Yoke and the CRT. Tilt the Deflection Yoke up or down to converge the vertical lines at top and bottom of screen and the horizontal lines at the right and left sides of the screen. Tilt the Deflection Yoke right or left to converge the vertical lines at the right and left sides of the screen and the horizontal lines at the top and bottom of the screen. Repeat convergence procedure if necessary to obtain best overall convergence. Apply adhesive to wedges and carefully replace on CRT.

CRT NECK ASSEMBLY



SAFETY RELATED ADJUSTMENTS

R559 CONFIRMATION METHOD (HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components PM501, 4608, 4607, R629, R628, R627, R559.

Preparation Before Confirmation.

1. Remove R675 on the G board and connect a variable resistor (RV1 about 10K) between pin 1 of IC653 and B+ line.
2. Supply 120VAC +/- 2.0VAC with variable transformer.

Hold-down Operation Confirmation

1. Turn the Power switch on, and receive a white signal. Adjust ABL current to 1650 +/- 80uA with Picture and Bright controls.
2. Increase B+ line voltage gradually by adjusting the resistance of RV1. Confirm that the MINIMUM voltage is less than 143.5V when the raster disappears during operation of the hold-down circuit.
   Note: When the hold-down circuit starts operating, turn the set off immediately.
3. Turn the Power switch on, and receive a dot pattern. Adjust ABL current to 150 +/- 50uA with Picture and Bright controls.
4. Increase B+ line voltage gradually by adjusting RV1. Confirm that the MINIMUM voltage is less than 146.5V when the raster disappears during operation of hold-down circuit.
   Note: When the hold-down circuit starts operating, turn the set off immediately.

Hold-down Readjustment

1. If Hold-down Operation Confirmation cannot be satisfied, readjustment should be performed by altering the resistance value of R559.

R570 CONFIRMATION METHOD (HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components IC653, PM501, Q608, 4607, D531, C545, C627, R570, R591, R627, R628, R675, T500

Preparation Before Confirmation.

1. Turn the Power switch on, and receive a white signal. Set the Picture and Bright controls to Maximum.
2. Confirm that the voltage at TP-85 is more than 108V when the set is operating normally with 120VAC supply.

Hold-down Operation Confirmation

1. Turn the Power switch on, and receive a white screen. Adjust ABL current to 1650 +/- 80uA with Picture and Bright controls.
2. Gradually apply DC voltage to TP-85, and confirm that the voltage is less than 137.5V when raster disappears during operation of the hold-down circuit.
   Note: When the hold-down circuit starts operating, turn the set off immediately.
3. Turn the Power switch on, and receive a dot pattern. Adjust ABL current to 150 +/- 50uA with Picture and Bright controls.
4. Gradually apply DC voltage to TF-85, and confirm that the voltage is less than 138.5V when raster disappears during operation of the hold-down circuit.
   Note: When the hold-down circuit starts operating, turn the set off immediately.

Hold-down Readjustment

1. If Hold-down Operation Confiition cannot be satisfied, readjustment should be performed by altering the resistance value of R570.

B+ VOLTAGE CONFIRMATION

The following adjustment should always be performed when replacing IC653 and R675.

1. Supply 130VAC +/-1VAC with variable auto-transformer.
2. Receive a monoscope signal.
3. Set Picture and Bright controls to initial reset position.
4. Confirm that the voltage at TP-91 is less than 137V.
5. If step 4 cannot be satisfied, replace IC653 and R675. Repeat above steps.

Courtesy of Manufacturer

SEMICONDUCTORS

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
CP110 (11)	RD6.2EB	-	NTE5013A	ECG5013A	SK6A2
D1,2	SEL1222R-D	-	-	-	-
	SEL1222R-C	8-719-311-89	-	-	-
D51	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D103	1SV113	8-719-974-81	NTE613	ECG613	SK3326
D104 - D109	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D250, 51	RD6.2ES-B2	8-719-109-93	NTE5013A	ECG5013A	SK6A2
D252	RD12ES-B2	8-719-110-31	NTE5021A	ECG5021A	SK12A
D300	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D301, 2	RD5.6ES-B2	8-719-109-89	NTE5011A	ECG5011A	SK5A6
D303	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D304	RD9.1ES-B2	8-719-110-13	NTE5018A	ECG5018A	SK9A1
D305	RD18ES-B1	8-719-110-48	NTE5026A	ECG5026A	SK17A
D306, 7	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D308	RD18ES-B2	8-719-110-49	NTE5027A	ECG5027A	SK18A
D310, 11	RD6.2ES-B2	8-719-109-93	NTE5013A	ECG5013A	SK6A2
D407	RD10ES-B2	8-719-110-17	NTE5019A	ECG5019A	SK10A
D408, 9	RD5.6ES-B2	8-719-109-89	NTE5011A	ECG5011A	SK5A6
D420, 21	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D500	U05G	8-719-911-55	NTE5806	ECG5806	SK3848
D501	RS3FS	8-719-312-71	-	-	-
D502	U05G	8-719-911-55	NTE5806	ECG5806	SK3848
D503	RU30A	8-719-312-72	-	-	-
D504, 5	U05G	8-719-911-55	NTE5806	ECG5806	SK3848
D506	RS3FS	8-719-312-71	-	-	-
D509	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D510	U05G	8-719-911-55	NTE5806	ECG5806	SK3848
D514, 15	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D517	RGP02-17	8-719-976-64	-	-	-
D519	RU3AM	8-719-300-33	NTE580	ECG580	SK3318A
D520, 21	EGP20G	8-719-979-85	NTE580	ECG580	SK5036
D531	EL1Z	8-719-302-43	NTE587	ECG587	SK9937
D540	RD24ES-B1	8-719-110-61	NTE5031A	ECG5031A	SK24A
D563	1SS119	8-719-911-19	NTE519	ECG519	SK3100
# D601	RBV-406H	8-719-305-07	NTE5330	ECG5330	SK9972
D602	S1VB10-S	-	NTE166	ECG166	SK9075
	S1VB40	8-719-511-40	NTE168	ECG168	SK3648
D603	GP08D	-	NTE156	ECG156	SK3051
	U05G	8-719-911-55	NTE5806	ECG5806	SK3848
D604	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D605	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D606	RD33ES-B2	8-719-110-78	NTE5036A	ECG5036A	SK33A
D621	1SS119	8-719-911-19	NTE519	ECG519	SK3100
D622	EU2A	8-719-302-06	NTE552	ECG552	SK9000
D623	RU-1P	8-719-311-31	NTE552	ECG552	SK9000
D624	RU4AM	-	NTE580	ECG580	SK5036
	RU4AM-T3	-	NTE580	ECG580	SK5036
	RU4DS	8-719-301-64	NTE506	ECG506	SK3925
D625	ERB93-02	8-719-948-59	NTE588	ECG588	SK9938

For SAFETY use only equivalent replacement part.
(11) Package contains three zeners.

SEMICONDUCTORS continued

(Select replacement for best results.)

	Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
	D627	ERB93-02	8-719-948-59	NTE588	ECG588	SK9938
	D701 - D709	1SS119	8-719-911-19	NTE519	ECG519	SK3100
	D710 - D713	1SS83	-	NTE177	ECG177	SK9091
	D900 - D910	RD9.1ES-B2	8-719-110-13	NTE5018A	ECG5018A	SK9A1
	D2011	RD3.6M-B1	8-719-105-51	-	-	-
	D2012	1S2837	-	NTE595	ECG595	SK9944
	MA152WK	8-719-400-18	-	NTE595	ECG595	SK9944
	D2102, 3	1S2837	-	NTE595	ECG595	SK9944
		MA152WK	8-719-400-18	NTE595	ECG595	SK9944
	D2106, 7	1S2837	-	NTE595	ECG595	SK9944
		MA152WK	8-719-400-18	NTE595	ECG595	SK9944
	D2108	EL1Z	8-719-302-43	NTE587	ECG587	SK9937
	D2130	1S2837	-	NTE595	ECG595	SK9944
		MA152WK	8-719-400-18	NTE595	ECG595	SK9944
	D2131	RD5.1M-B2	8-719-105-82	-	-	-
	D2550, 1	RD6.8M-B1	8-719-106-16	-	-	-
	D2552, 3	RD12M-B1	8-719-106-70	-	-	-
	IC51	SBX1483-59	8-741-148-33	-	-	-
	IC101	M37100M8-115SP	8-759-635-34	-	-	-
	IC102	PCD8582	8-759-972-43	-	-	-
	IC103	MN1280-S	8-759-403-44	-	-	-
	IC104	MB88201-638L	8-759-978-66	-	-	-
	IC251	CXA1264AS	8-752-037-24	-	-	-
	IC301	CXA1313S	8-752-035-52	-	-	-
	IC402, 3	NJM2245S	8-759-710-68	-	-	-
	IC405	TDA2009A	8-759-980-43	-	-	-
	IC444	CXA1114P	8-752-053-17	-	-	-
	IC500	TDA8172	8-759-980-58	NTE1788	ECG1788	SK9875
	IC531	RC4558P	8-759-945-58	NTE778A	ECG778A	SK3465
	IC601	UPC78N05H	8-759-112-06	-	-	-
#	IC603	UPC7893HF	8-759-142-04	-	-	-
#	IC604	UPC78N05H	8-759-112-06	-	-	-
#	IC651	STRS6301	-	-	-	-
		STR-S6301	8-749-920-57	-	-	-
	IC652	PS2501-1LB	8-719-156-73	-	-	-
#	IC653	SE-135NS	8-749-920-62	-	-	-
	IC2000	CXA1315P	8-752-035-53	-	-	-
	IC2102	SN74LS123N	8-759-901-23	NTE74LS123	ECG74LS123	SK74LS123
	IC2103	TA8601BN	-	-	-	-
		TA8601BN-FA-1	8-759-234-63	-	-	-
	IC2104	SN74LS19AN	8-759-989-67	-	-	-
	IC2201,2,3	D6901G	-	-	-	-
		UPD6901G	8-759-148-69	-	-	-
	IC2204	D42272AGF	-	-	-	-
		UPD42272AGF	8-759-149-90	-	-	-
	IC2206	C661G	-	-	-	-
		UPC661G	8-759-148-68	-	-	-
#	IC2601	78M05A	-	NTE960	ECG960	SK3591
		RC78M05FA	8-759-982-31	NTE960	ECG960	SK3591

For SAFETY use only equivalent replacement part.

SEMICONDUCTORS continued

(Select replacement for best results.)

	Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
#	IC2602	78L12A	-	NTE950	ECG950	SK9169
		RC78L12A	8-759-982-26	NTE950	ECG950	SK9169
#	IC2603	MC7809CT	8-759-030-99	-	-	-
	Q101 - Q103	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q105	2SA1309AR	-	NTE2362	ECG2362	SK10094
		2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
	Q106 - Q108	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q130	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q202, 3	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q301, 2	2SA1309AR	-	NTE2362	ECG2362	SK10094
		2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
	Q303	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q304	2SA1309AR	-	NTE2362	ECG2362	SK10094
		2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
	Q305, 6	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q307	2SC1652RE	-	NTE18*	ECG18*	SK9666*
		2SC2673-Q	8-729-967-32	NTE20*	ECG20*	SK9668*
	Q308	2SA937R	-	NTE17	ECG17	SK9665
		2SA937-Q	8-729-993-72	NTE17	ECG17	SK9665
	Q309 - Q312	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q313	2SA1309AR	-	NTE2362	ECG2362	SK10094
		2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
	Q314	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q315	2SA1309AR	-	NTE2362	ECG2362	SK10094
		2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
	Q316 - Q318	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q400 - Q408	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q409	2SA1309AS	-	NTE2362	ECG2362	SK10094
		2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
	Q410	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q413 - Q417	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q430 - Q432	2SC3311AR	-	NTE2361	ECG2361	SK10093
		2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
	Q433	2SA1309AS	-	NTE2362	ECG2362	SK10094
		2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
	Q501	2SC2688	-	NTE157	ECG157	SK3747
		2SC2688-LK	8-729-119-80	NTE157	ECG157	SK3747

For SAFETY use only equivalent replacement part.
* Lead configuration may vary from original.

SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q502	2SD1886	-	NTE2324	ECG2324	SK10136
	2SD1886CA	8-729-822-65	NTE2324	ECG2324	SK10136
Q504	2SA1309AR	-	NTE2362	ECG2362	SK10094
	2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
Q505	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q530	2SD1761F	-	-	-	-
	2SD1408-Y	8-729-202-03	NTE291	ECG291	SK3440
Q601	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q603	2SA1091R	-	NTE288	ECG288	SK3434
	2SA1091-O	8-729-200-17	NTE288	ECG288	SK3434
Q604	2SA1309AR	-	NTE2362	ECG2362	SK10094
	2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
Q605, 7	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q608	2SA1309AR	-	NTE2362	ECG2362	SK10094
	2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
Q611, 12	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q701	2SC2611	8-729-326-11	NTE157	ECG157	SK3747
Q702	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q703	2SA1091R	-	NTE288	ECG288	SK3434
	2SA1091-O	8-729-200-17	NTE288	ECG288	SK3434
Q704	2SC2611	8-729-326-11	NTE157	ECG157	SK3747
Q705	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q706,7	2SA1091R	-	NTE288	ECG288	SK3434
	2SA1091-O	8-729-200-17	NTE288	ECG288	SK3434
Q708	2SC2611	8-729-326-11	NTE157	ECG157	SK3747
Q709	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q710	2SC2551-O	8-729-255-12	NTE399	ECG399	SK9352
Q711	2SA1309AR	-	NTE2362	ECG2362	SK10094
	2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
Q712	2SC2551-O	8-729-255-12	NTE399	ECG399	SK9352
Q713	2SA1309AR	-	NTE2362	ECG2362	SK10094
	2SA1309A-QRS	8-729-423-44	NTE2362	ECG2362	SK10094
Q714 - Q716	2SA1091-O	8-729-200-17	NTE288	ECG288	SK3434
Q900, 1	2SC3311AR	-	NTE2361	ECG2361	SK10093
	2SC3311A-QRS	8-729-423-37	NTE2361	ECG2361	SK10093
Q2101 - Q2103	2SA1037K	-	NTE2409	ECG2409	SK10100
	2SA1162-G	8-729-216-22	NTE2409	ECG2409	SK10100
Q2104 - Q2109	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2114 - Q2116	2SA1037K	-	NTE2409	ECG2409	SK10100
	2SA1162-G	8-729-216-22	NTE2409	ECG2409	SK10100

* Lead configuration may vary from original.

continued

SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q2117	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2119, 20	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2121	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC2713-L	8-729-271-32	-	ECG2410*	-
Q2122, 3	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2125	2SA1037K	-	NTE2409	ECG2409	SK10100
	2SA1162-G	8-729-216-22	NTE2409	ECG2409	SK10100
Q2130, 1	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2133, 4	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2139	2SA1037K	-	NTE2409	ECG2409	SK10100
	2SA1162-G	8-729-216-22	NTE2409	ECG2409	SK10100
Q2200	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2201 - Q2204	2SA1037K	-	NTE2409	ECG2409	SK10100
	2SA1162-G	8-729-216-22	NTE2409	ECG2409	SK10100
Q2232	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099
Q2244, 5	2SC3052E	-	NTE2406*	ECG2406*	SK10097
	2SC1623-L6	8-729-100-66	NTE2408	ECG2408	SK10099

* Lead configuration may vary from original.

RESISTORS

	Item No.	Rating	Mfr. Part No.	NTE Replacement
	CP101	Resistor Network 47K x 5% x 8	1-236-294-11	-
	CP102	Resistor Network 10K x 5% x 4	1-236-491-11	-
	CP103	Resistor Network 47K x 5% x4	1-236-358-21	-
	CP107	Resistor Network 10K x 5% x 4	1-236-491-11	-
	CP109	Resistor Network 4700 x 5% x 4	1-236-776-11	-
	R161	1000 5% 2W NF Mtl Flm	1-215-892-11	2W102
	R266	30K 1% 1/6W Mtl Flm	1-215-456-00	-
	R268	220 5% 1W NF Mtl Flm	1-215-865-11	1W122
	R311	13K 1% 1/6W Mtl Flm	1-215-448-00	-
	R313	1000 1% 1/6W Mtl Flm	1-215-421-00	-
	R341	33K 1% 1/6W Mtl Flm	1-215-457-00	-
	R502	1500 5% 2W NF Mtl Flm	1-215-893-11	2W215
	R503	1500 5% 2W NF Mtl Flm	1-215-893-11	2W215
	R505	5600 5% 1/4W NF Cbn Flm	1-247-722-11	QW256
	R506	.47 5% 1W NF Mtl Flm	1-216-345-11	1WD47
	R510	47 5% 1/4W NF Cbn Flm	1-247-696-11	QW047
	R512	47 5% 2W NF Mtl Flm	1-215-884-11	2W047
	R513	100 5% 2W NF Mtl Flm	1-215-886-11	2W110
	R515	3.9 5% 2W NF Mtl Flm	1-216-376-00	2W3D9
	R519	3.9 5% 2W NF Mtl Flm	1-216-376-00	2W3D9
	R523	100 5% 2W NF Mtl Flm	1-215-886-11	2W110
	R530	680 5% 1/4W NF Cbn Flm	1-247-711-11	QW168
	R533	10 5% 2W NF Mtl Flm	1-215-880-00	2W010
	R540	1 5% 2W NF Mtl Flm	1-216-369-00	2W1D0
	R546	11K 1% 1/6W Mtl Flm	1-215-446-00	-
	R551	39K 1% 1/6W Mtl Flm	1-215-459-00	-
	R552	2.2 5% 1/4W NF Cbn Flm	1-249-385-11	QW2D2
	R554	1.5 5% 2W NF Mtl Flm	1-216-371-00	2W1D5
#	R563	270 5% 2W NF Mtl Flm	1-216-453-91	2W127
	R564	1000 5% 1W NF Mtl Flm	1-215-869-11	1W210
#	R565	6.8 5% 2W NF Mtl Flm	1-216-379-91	2W6D8
	R566	.47 5% 1/4W NF Cbn Flm	1-249-443-11	-
	R567	.47 5% 1/4W NF Cbn Flm	1-249-377-11	-
#	R569	12 5% 2W NF Mtl Flm	1-216-445-91	2W012
	R574	220 5% 1/4W NF Cbn Flm	1-249-409-11	QW122
	R591	4.7 5% 1/4W NF Cbn Flm	1-249-455-11	QW4D7

#

For SAFETY use only equivalent replacement part.

RESISTORS continued

	Item No.	Rating	Mfr. Part No.	NTE Replacement
#	R601	2.2M 10% 1/2W Cbn Cmp	1-202-723-91	HW522
	R602	1.2 5% 15W WW	1-205-900-11	-
	R603	82K 5% 1W NF Mtl Flm	1-216-444-11	1W382
	R604	56 55 1W NF Mtl Flm	1-216-425-11	1W056
	R606	.47 5% 3W NF WW	1-207-645-00	-
	R610	680 1% 1/6W Mtl Flm	1-215-417-00	-
	R611	220K 1% 1/6W Mtl Flm	1-215-477-00	-
	R619	4700 5% 2W NF Mtl Flm	1-215-896-00	2W247
	R620	4700 5% 2W NF Mtl Flm	1-215-896-00	2W247
#	R625	3.3 5% 3W NF Mtl Flm	1-216-395-51	3W3D3
	R626	.47 5% 1/4W NF Cbn flm	1-249-443-11	-
	R650	1500 5% 2W NF Mtl Flm	1-215-893-11	2W215
	R651	1800 5% 2W NF Mtl Flm	1-216-458-11	2W218
	R652	56 5% 3W NF Mtl Flm	1-216-473-11	3W056
	R653	56 5% 3W NF Mtl Flm	1-216-473-11	3W056
	R654	.1 10% 2W NF WW	1-207-612-00	-
	R655	.47 10% 2W WW	1-207-616-00	-
	R656	560 5% 1/4W Cbn Flm	1-249-414-11	QW156
	R658	68k 5% 2W NF Mtl Flm	1-215-903-11	2W368
	R659	68K 5% 2W NF Mtl Flm	1-215-903-11	2W368
	R660	68K 5% 2W NF Mtl Flm	1-215-903-11	2W368
	R661	68k 5% 2W NF Mtl Flm	1-215-903-11	2W368
	R663	15 5% 2W NF Mtl Flm	1-215-881-11	2W015
	R664	18 5% 2W NF Mtl Flm	1-216-446-00	2W018
	R666	470 5% 1/4W NF Cbn Flm	1-249-413-11	QW147
	R667	82K 5% 1W NF Mtl Flm	1-216-444-11	1W382
	R669	.22 5 1W NF Mtl Flm	1-216-341-11	1WD22
	R671	.22 5% 1W NF Mtl Flm	1-216-341-11	1WD22
	R672	1200 5% 2W NF Mtl Flm	1-216-457-00	2W212
	R673	4.7 5% 1/4W NF Cbn Flm	1-249-389-11	QW4D7
	R674	68K 5 1/4W NF Cbn Flm	1-249-439-11	QW368
	R675	120 5% 1/4w NF Cbn Flm	1-249-406-11	QW112
	R679	56 5% 3W NF Mtl Flm	1-216-473-11	3W056
	R701	1.5 5% 3W NF Mtl Flm	1-216-391-11	3W1D5
#	R713	8200 5% 3W NF Mtl Flm	1-216-486-51	3W282
#	R716	8200 5% 3W NF Mtl Flm	1-216-486-51	3W282
#	R720	8200 5% 3W NF Mtl Flm	1-216-486-51	3W282
	R731	220 5% 1/4W NF Cbn Flm	1-247-704-11	QW122
	R732	220 5% 1/4W NF Cbn Flm	1-247-704-11	QW122
	R733	220 5% 1/4W NF Cbn Flm	1-247-704-11	QW122
	R740	47K 5% 2W NF Mtl Flm	1-215-902-11	2W347
	R742	10K 5% 1/4W NF Cbn Flm	1-249-429-11	QW310
	R743	10K 5% 1/4W NF Cbn Flm	1-249-429-11	QW310
	R744	10K 5% 1/4W NF Cbn Flm	1-249-429-11	QW310
	R745	10K 5% 1/4W NF Cbn Flm	1-247-713-11	QW310
	R746	47K 5% 1W NF Mtl Flm	1-215-902-11	1W347
	R747	10K 5% 1/4W NF Cbn Flm	1-247-725-11	QW310
	R2111	1800 .5% 1/10W Mtl Chp	1-216-657-11	-
	R2112	1800 .5% 1/10W Mtl Chp	1-216-657-11	-

For SAFETY use only equivalent replacement part.

RESISTORS continued

	Item No.	Rating	Mfr. Part No.	NTE Replacement
	R2113	1500 1% 1/6W Mtl Flm	1-215-425-00	-
	R2117	1500 .5% 1/10W Mtl Chp	1-216-655-11	-
	R2122	1600 .5% 1/10W Mtl Chp	1-216-656-11	-
	R2124	3600 1% 1/6W Mtl Flm	1-215-434-00	-
	R2127	1500 .5% 1/10W Mtl Chp	1-216-655-11	-
	R2145	.47 5% 1/4W NF Cbn Flm	1-249-377-11	-
	R2535	10 5% 1W NF Mtl Flm	1-215-857-11	1W010
	R2552	180 .5% 1/10W Mtl Chp	1-216-633-11	-
#	THP601	4.7 Cold PTC	1-808-081-23	-

For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

	Item No.	Function	Mfr. Part No.	Number on unit	Russell Part No.
#	L515	Horiz Linearity	1-459-224-13	-	-
#	L550	Yoke 110° Horiz .81mh Vert 21mh	1-451-275-31	1-451-275-12	-
#	T500	Horiz Output	1-439-416-41	1-439-423-21	FBT-229
#	T501	Horiz Drive	1-437-195-12	1-437-195-11	-
#	T502	PMT	1-421-794-11	-	-
#	T604	Power	1-448-916-11	-	-
#	T651	Switching	1-449-953-11	-	-

For SAFETY use only equivalent replacement part.

SPEAKERS

Item No.	Description	Mfr. Part No.	Quam Part No.
SP1, SP2	Sealed Unit, 8 ohms	1-544-313-11	-

CONTROLS

(All wattages 1/2 watt or less, unless otherwise listed.)

	Item No.	Function	Resistance	Mfr. Part No.
	RV701	Focus	2.2M	1-230-641-11
#	RV702	H. STAT	110M	1-230-619-11
	RV2103	Position	2200	1-238-013-11
	RV2105	B Level	2200	1-238-013-11
	RV2106	Sub Hue	22K	1-238-017-11
	RV2107	Sub Color	10K	1-238-016-11
	RV2108	Contrast	1000	1-238-012-11
	RV2200	B-Y Adj	470K	1-238-023-11
	RV2201	R-Y	470K	1-238-023-11

For SAFETY use only equivalent replacement part.

CAPACITORS

	Item	Rating	Mfr. Part No.
	C309	39 NPO 50V 5%	1-102-965-00
#	C506	330 2KV 10%	1-162-115-91
#	C507	.02 3% 2KV	1-137-024-11
#	C509	.047 400V 5%	1-136-313-51
#	C551	.1 200V 10%	1-108-433-91
#	C601	.47 125V 20%	1-136-311-51
#	C603	.001 400V 10%	1-162-576-51
#	C604	.47 125V 20%	1-136-311-51
#	C605	.0047 400V 20%	1-161-953-92
#	C606	.0047 400V 20%	1-161-953-92
	CP104	Cap Network 220 x 20% x 8	1-236-479-11
	CP106	Cap Network 220 x20% x 8	1-236-301-11
	CP108	Cap Network 220 x 20% x 8	1-236-301-11
	CP301	Cap Network 47 x 3	1-236-730-11

For SAFETY use only equivalent replacement part.

ELECTROLYTIC CAPACITORS

Item	Rating	Mfr. Part No.
C261	1 16V 20%	1-131-347-00
C267	3.3 16V 10%	1-131-368-00
C269	1 16V 20%	1-131-347-00
C277	10 16V 20% NP	1-126-320-11
C463	10 16V 20% NP	1-126-320-11
C2107	1 50V 20% NP	1-124-499-11
C2108	1 50V 20% NP	1-124-499-11
C2109	1 50V 20% NP	1-124-499-11
C2141	4.7 50V 20% NP	1-124-768-11
C2235	2.2 50V 20% NP	1-124-767-00